BRITAIN'S BEST SELLING MAGAZINE FOR THE
CPC
464 • 664 • 6128
ISSUE 53 • FEBRUARY 1990 • £1.45

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AMSTRAD ACTION

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– if you dare!

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Untouchables
– challenge The Mob in Ocean's blockbuster



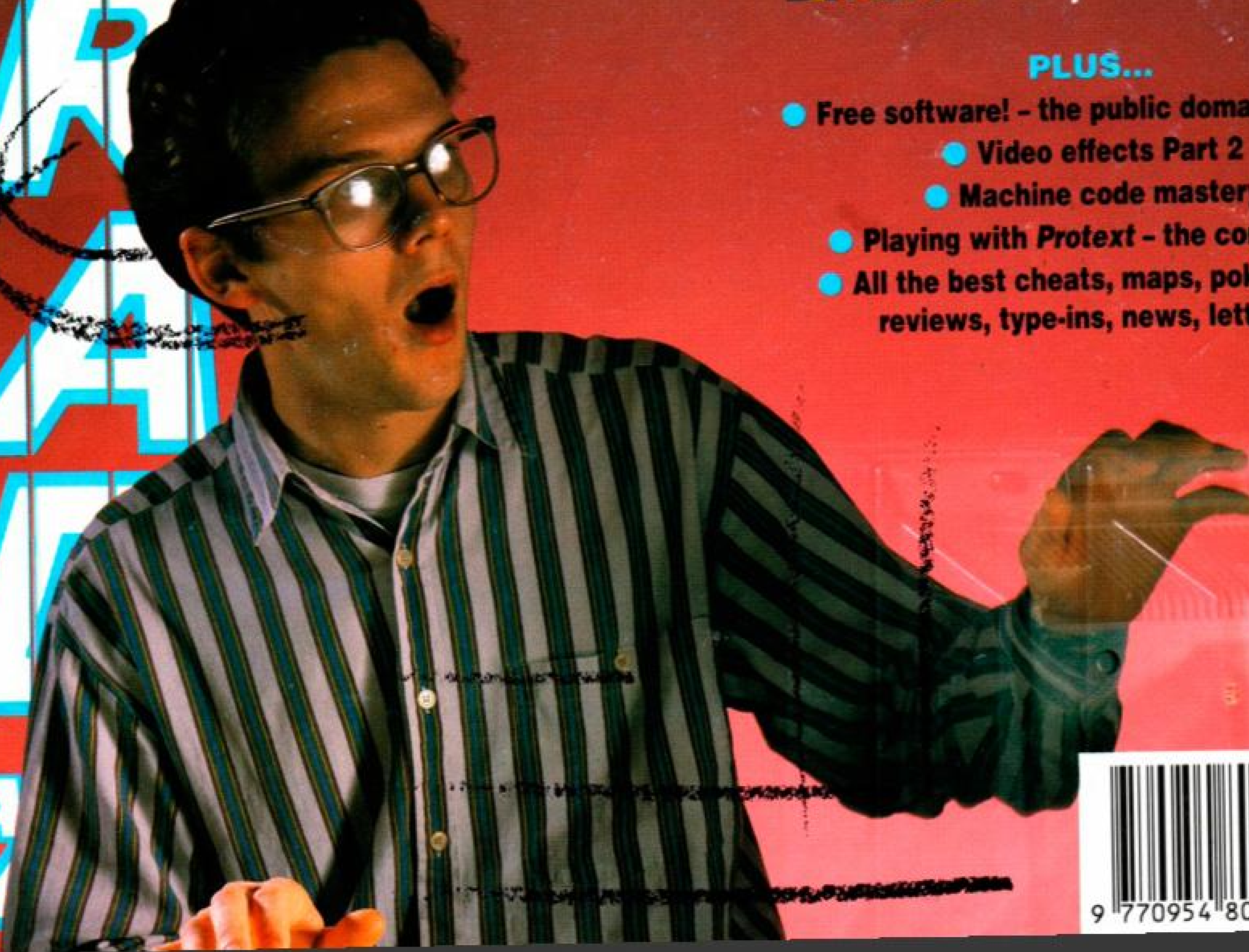
Jack Nicklaus Golf
– tops in the clubhouse?



Hard Drivin'
– Domark makes the grade. Can you?

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'ILATION PACKS





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AMSTRAD ACTION ● FEBRUARY 1990

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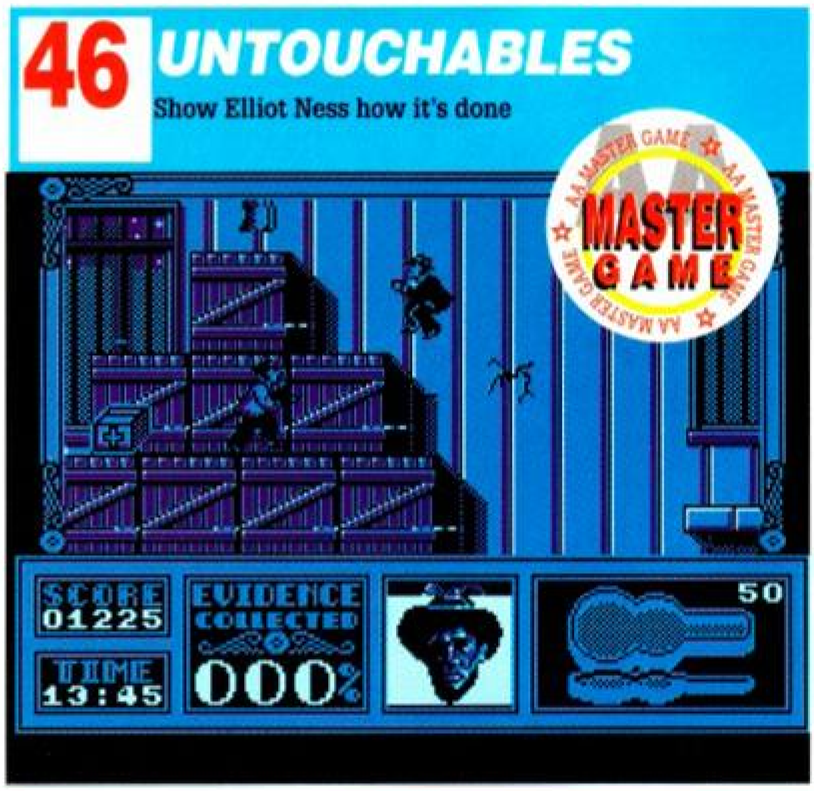
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THE ACTION BEGINS ON 43!

THE VERY BEST IN CPC ENTERTAINMENT





Bigger than ever

Well, Christmas has come – and gone – and those quality games are still pouring out. There's the incredible fast filled 3D *Hard Drivin'* from Domark for a start. The monochrome main display doesn't make for a great first impression, but in terms of a really playable driving sim, Domark's latest is a corker. There are even rumours of additional 'scenario' disks to follow...

And of course there's the wonderful *Untouchables*, already featured on last month's covertape. Ocean took a brave decision in going for single-colour graphics, but the results are highly atmospheric, highly detailed and superbly animated.

Last but not least is Accolade's *Jack Nicklaus Golf*. The sport may not be everyone's cup of tea, but anyone can appreciate how golf games have evolved since the original *Leaderboard*. The graphics are simply stunning.



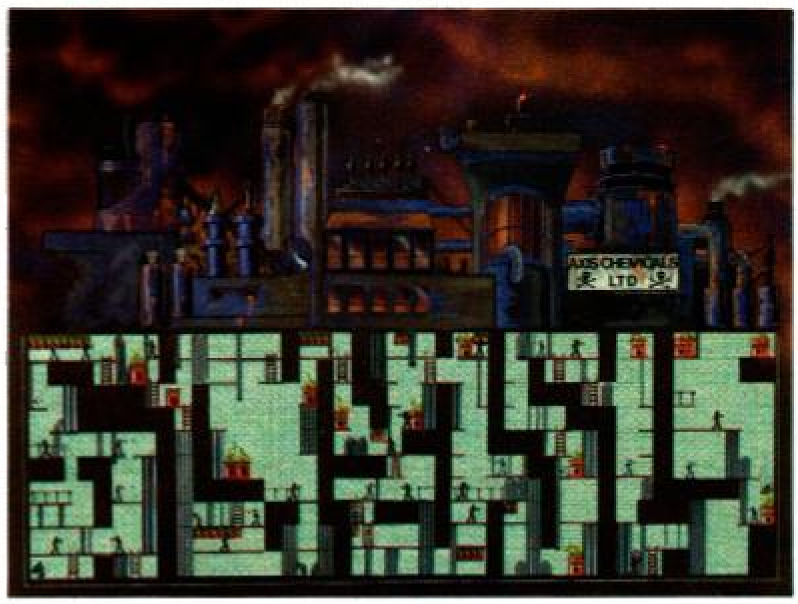
Software houses are really starting to make the best of the CPC – at last! And if you thought this month's crop of new releases was impressive, just hold on tight for *Chase HQ* next month...

Rod



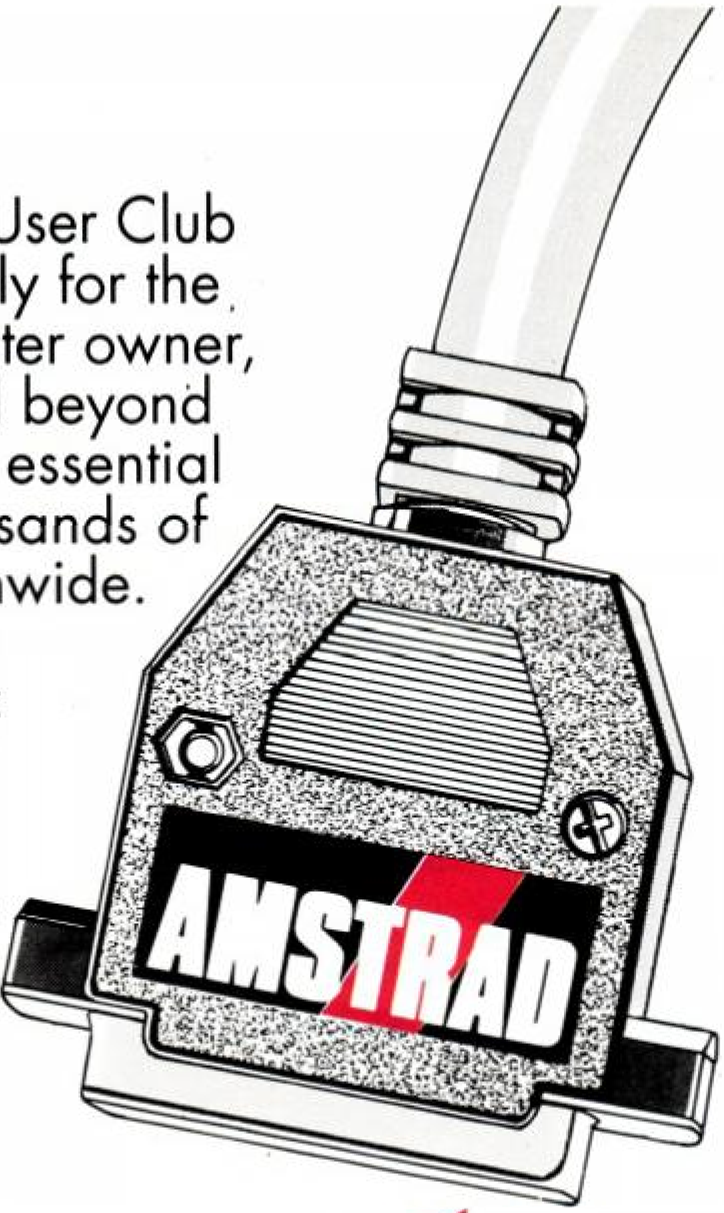






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464 UPGRADES BANNED!

Locomotive Software withdraws 6128 ROMs after licensing row with Amstrad

Stand-alone 6128 ROMs have been withdrawn from sale. Due to a rift between Amstrad and Locomotive, owner of the software rights to the BASIC contained on the ROMs, the chips are no longer available individually. This is potentially disastrous news for 464 owners planning to upgrade their machines to 6128 specs.

Locomotive wrote both the operating system and the BASIC for the CPC. Amstrad then bought the operating system outright, but continued to license the 6128 BASIC from Locomotive. The licensing arrangement covered the use of 6128 BASIC ROMs as parts of whole 128K machines, but not the sale of the ROMs as separate items.

However, Locomotive discovered that the ROMs were being sold outside the licencing agrement and without payment to them. Outraged, the company confronted Amstrad – with the result that 6128 ROMs are no longer available individually to users wanting to upgrade their 464s. Business-wise this may be good move, but for 464 owners and the many small companies which depended on the upgrade service it is a disaster.

The information first came to light as firms providing the service found that supplies had dried up. *AA* attempted to contact both Locomotive and Amstrad, but neither were available for comment at the time of going to press.

CPC gets the push

The CPC was finally given the support it needed this Christmas with a major advertising campaign in both the national press and specialist magazines. Part of Amstrad's £7,000,000 sales strategy for boosting its share in the consumer electronics market, the ads pushed the CPC's versatility and power as both a serious and games machine. The CPC's image has been adapted for the 90's with lurid pictures and streetwise banter – all part of the pitch. It appears that Amstrad has eventually realised what a goldmine it's been sitting on and is at long last beginning to exploit the CPC's vast sales potential.



Ocean cleaned up!

It was all tears and speeches when the computer entertainment world held its annual Industry Dinner (Ind–Din) in London on the 18th December. The event was dedicated to raising money for the Royal Variety Club of Great Britain and also featured the results of an industry-wide poll on the year's best software. The event gives programmers a brief moment of glory and software houses the chance to slap each other on the back.

This year's event was hosted by Lenny Henry and raised a staggering £27,500 for the Variety Club from spontaneous donations, pledges and an auction.

The results of the voting were: **Best Budget 8-bit** – *Postman Pat*, which was the first of a new wave of licences from Alternative aimed specifically at the £2.99 and under market. **Best Adventure 8-bit** went to Origin Systems for its *Gauntlet*-style *Times of Lore*. The **Best Simulation 8-bit** was won by a game only now being coded for the CPC – *Stunt Car Racer* from Microprose. *Chase HQ*, the highly-rated arcade was finished just in time and scooped the **Arcade Licence Translation 8-bit** prize (see *AA* 54 for the full review). This month's Mastergame – *Untouchables*, from Ocean – was awarded **Best Arcade game 8-bit**, while the **Best Sound and Music 8-bit** trophy was carried off by US Gold's *Turbo Out Run*. **Best Graphics 8-bit** went to System 3's *Myth*. Ocean's Rave, *Batman – The Movie* – deservedly grabbed the prize for the **Best Translation of a Non-arcade Licence** on both **8 and 16-bit**. The **Originality** award went to System 3, while the **Best Advertisement** title was claimed by Mindscape for its *Fiendish Freddy* artwork – we'll be seeing the game later this year on its CPC debut.

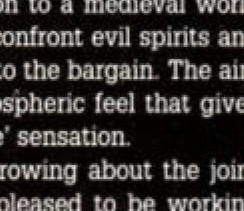
Other results of interest include **Best Arcade 16-bit** and an ovation which went to Anco's *Kick Off*, a game that will be seen any day soon on a CPC near you. The most coveted prize of the evening, however, was firmly claimed by Ocean, which was voted **Best Software House**. Not really surprising as it carried off over a quarter of the silverware! *AA* was once again snubbed in the **Magazine of the Year** category, which was won by multi-format glossy *The One* (*never heard of it – ed*).

Domark get Incentive

Incentive, the programming stars behind the *Freescape* classics *Total Eclipse*, *Dark Side* and *Driller*, has joined forces with Domark for their forthcoming project *Castle Master*. The tie-up allows Incentive to get on with what it does best – programming – while the experts at Domark handle the ever more complex marketing needed to ensure that great games get the sales they deserve.

Castle Master will naturally be based on the solid 3D system that has made Incentive famous. This time Incentive switches its attention to a medieval world where you have to confront evil spirits and rescue a Princess into the bargain. The aim is to create an atmospheric feel that gives you that 'being there' sensation.

Both sides are crowing about the joint venture. "I'm very pleased to be working with Domark. They're good to do business with and very professional" was the way Incentive's boss Ian Andrew saw the deal. Domark was no less enthusiastic about having what looks to be another guaranteed hit in their stable. "It's completely brilliant. Just wait and see the results!" enthused Domark's Mark Strachan. "I've always respected Ian's innovation and I'm delighted to be joining forces with his company!"



DATABASE EXHIBITIONS IN SURPRISE TAKEOVER

Database Exhibitions Ltd, the company behind the recent roaring success of the *Computer Shopper* Show, has been taken over by Blenheim Exhibitions Group plc, Europe's largest independent exhibitions and conference organiser.

Database Exhibitions has been around since 1982, when it organised a show for owners of Apple computers. At its peak in 1987 it was holding more than a dozen shows a year – including the Amstrad Computer Show – and attracted more than 1,000 exhibitors and close to 200,000 visitors.

Blenheim has held more than 200 events in nine countries covering 20 different market sectors. The company concentrates on information technology, though, and over 70 of its shows have been IT-based.

The move will stengthen Blenheim's existing portfolio of information technology events, and Database will benefit from the expansion into the European marketplace.

Continental events have already been planned for 1990, including the European Computer Expo in Cannes, and Computer Arena in Malta.

For futher information on forthcoming events, give Database a call on 0625 879963.

Easier said than done

Prospective purchasers of the budget art package *Art the Easy Way* should note that the program will run on 128K machines only. A point we neglected to mention in last month's review.

The software sells at the give-away price of £5.95 on tape and £8.95 on disk, and is available from the programmer, John Packham, 60 Highton Towers, Warburton Road, Southampton, Hants, SO2 6H



Printing on the move

Straight out of the days of the ZX81 comes a printer that uses the old-fashioned thermal technology from a long-gone age.

Applied Systems Developments Ltd, the company behind the printer, is citing its machine as "a truly portable printer for the man on the move".

The tiny printer – with dimensions of less than 12 x 6 x 3 inches – works by jumping a high voltage spark of electricity from a stylus onto a roll of metallicised paper. Characters are produced by building up an image with blackened dots as the metal is burned away from the paper. The quality of the printout is fine for listings and the like, but not the sort of thing you'd want to send to your bank manager...

Although this type of printer has been until now essentially extinct, it has the advantage of being small, quiet, cheap to produce and – now – portable.

Two versions of the machine are available. The portable version, operated from the mains, rechargeable battery, or car cigarette lighter, retails at £159 plus VAT, whilst a mains-only model will cost you £99 plus VAT. Both prices include a 100-



Careers in computing



If you're interested in computing as a career then a newly published booklet, imaginatively titled *Working in Computing*, may be worth a look.

It looks at several different aspects of computing, using case studies to guide the reader through the ins and outs of their prospective careers. There's even section on the leisure side, which includes a study on a computer journalism – we'll have to watch our backs!

Well-written and informative, the booklet is aimed at the youngster deciding on their future job prospects and adults considering a career change.

Working in Computing (ISBN 086110-524-9) is published by the Careers and Occupational Information Centre and costs £2.35 plus 50p postage and packing from COIC, Rockery Cottage, Sutton-cum-Lound, Retford, Notts, DN22 8PJ (0777 705951).

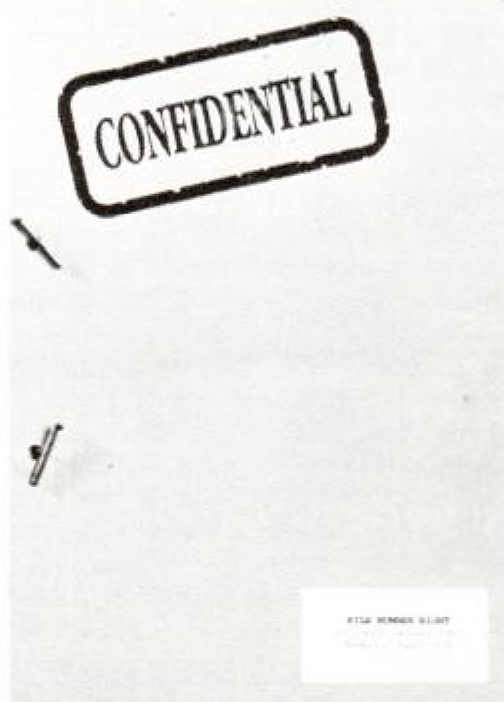
Adventurers' secrets published!

AA secret agents have just got their hands on a *Confidential* document that we are revealing – at great personal risk – to our readers.

The 32-page dosier contains classified information on all manner of adventuring topics, including news, reviews, hints and tips, and in-depth articles. The bi-monthly magazine has plenty to offer to the CPC adventurer. Subscribers also get access to an adventure helpline and special offers on software.

We will be feeding the publication to a hungry *Balrog* who will be including an adventurers fanzine round-up in a forthcoming issue of *AA* – look out for it.

The current issue of *Confidential*, number eight, is available from Inter-Mediates Ltd, PO Box 847, Harlow, Essex, CM21 9PH.



Empire strikes back

Empire continues to press forward with a whole bevy of releases into the New Year, and is currently previewing *Wild Streets* and *Dark Century*. The first is a wild and crazy beat-em-up extravaganza with a *Renegade*-style character fighting his way to the rescue of an heiress in trouble. Program notes boast big sprites and near-perfect animation, as well a rather neat panther who is your character's guide and protector – and which gets stuck in whenever you get stuck.



Dark Century has you tracking down four prisoners who have sworn an oath of vengance to destroy the Earth. You've got six fully-programmable tanks to help you in your task. The game features one or two-player mode, split screen action, 3D ray-traced graphics and the strange codename 'Take No Prisoners'!. The first screen shots have landed on the *AA* desks and look really promising – and these are just the roughs.



Chase HQ OK!

1989's Aracade of the Year *Chase HQ* should finally emerge on the CPC any day now. It gives you the chance to play a crash-happy copper who 'nings around ramming perps off the road. The scrolling looks ultra-smooth and ultra fast, especially when you kick in the turbo boost. If we can prize the disk out of Adam 'Mad Max' Waring's hand, we'll be bringing you the inside story next month

MICROPROSE CHANGES GEAR

The new software giant of '89 was surely simulations specialist Microprose – which aquired Telecomsoft from BT.

It's been starting this year with a new interest in the CPC. The first cheering news from Tetbury is that *Stunt Car Racer* is to be converted for the Amstrad. On other formats it received praise by the bucketload for its 3D graphics and sheer playability. You play the driver of a *Powerdrift*-style car, racing one-on-one in a stunt circuit league. With features like cumulative damage over a season and special head-to-head match ups for inter-league promotion, it looks set to be a stunner. The *AA* test drive squad are ready and waiting to bring you a full report ASAP.

Microprose has also signed up a team of in-house programmers – a brave move. Their prime task is to ensure quick and quality conversions between formats, a task that has become ever more difficult to achieve as the company's output has rocketed sky-high since the takeover of the 'Bird labels.

Firebird has announced the title of its new martial arts simulator – *Oriental Games*. It features four events: Kung Fu, Kendo, Hollywood Rules Kickboxing and Sumo. So, if like Rod you're still trying to shed those pounds gained at Christmas, this could be just the game for you, as you compete with the big boys, as it were. The gloves are off shortly for the full review.

P 47 looks like being another epic in the making. Not a social security simulator (!), this is a horizontally-scrolling shoot-em-up set in the Second World War and featuring the eponymous plane. As the kite has homing missiles and smart bombs as part of its special arsenal, it's not going to win any prizes in the accuracy stakes – but from the

X-out – out!

X-Out from Rainbow Arts – as mentioned last month – has been on the review cicuit recently and it looks as if ARC developemnets has done it again. Like the forthcoming *Darius*, it's an underwater shoot-em-up, but it boasts several unique features. The most impressive is the do-it-yourself ship designer, where you can choose the amount of armour you carry, the position and function of drone ships and even the number of lives you have. *AA* will be dipping its toe in the



● **Underwater action in *X-Out*.**

Iron lord

This time last year UBI Soft first touted its game *Iron Lord* as an imminent release. Now it's finally on its way. In this action adventure you must right the wrongs of your evil uncle and set the fair kingdom back on the path of peace, justice and the American way. As soon as *Iron Lord* returns from the crusade, we'll be there fighting our way through to a full review.





REACTION

Got something to say? Here's where our readers tell it how it is...

●Dirty dogs

I have a serious trouble: I don't find true penpals in England. You must know in my country, Italy, there are very little Amstrad CPC users, because this fantastic computer arrived later than other systems, as C64 or Spectrum. Five months ago I knew your fantastic magazine and I was very happy, because I noticed in England there is a few of CPC users. Then I decided to swap tips, pokes or games with some helpliner, but I've had great deceptions; in fact I sended an exhaustive letter with my list to three helpliners about four months ago. They replied with their list and the titles they wanted from my list. I sended at once those titles with my requests, but they haven't sended anything, neither after my letters of protest.

Now, I would know, are all CPC users impostor? If you answer "no", can you give me some address of true penpals?

Claudio Pistacchio
Italy

AA: *OK, laugh – but can you speak Italian? Claudio also sent the names and addresses of his penpals – to save embarrassment we didn't print them. How about it, lads? You know who you are, don't you!*

In fact, we'll go a little further. Anyone who accepts games off another Helpliner and then doesn't reply gets taken off the Helpline list. We might even start compiling a blacklist. You have been warned...

Meanwhile, a message to Claudio – if you still don't hear anything from your penpals after this, let us know. We'll be very interested.



● *Shopper* Show: lived up to its name.

●Falling standards

I recently had the fortune to be able to get into the *Computer Shopper* Show at Ally Pally. Imagine then my disappointment to find very little there for the CPC range. The vast majority of stalls carried all manner of things for the 16-bit machines, though.

It has long been my view that there is more to gaming than pretty graphics and sound, and this is the main reason why I "upgraded" to a 6128 and no higher.

Although the vast majority of 8-bit software now seems to be of the "if it moves blast it or (even worse) kick it" variety, I am sad though unsurprised to see 16-bit going the same way.

There was a time when I would have considered 16-bit as a serious proposition, but watching all the youngsters trooping off with their "Batpacks" etc has finished that idea for good.

It is a fact of life that software companies only produce games that will sell well, and with so much money in the pockets of impressionable children (7-14), I suppose it's obvious that for every £10 spent on hype, £20+ rolls into the coffers.

Just have a look through the back issues of *AA* and see how many licensed games have had good reviews. Also, I wonder how many are still being played.

Watch out, 16-bitters, you are about to bring yourselves down to our level!

Another example of "progress" has been the advent of the "computer expert", frequently on display at many department stores, or even in specialised shops.

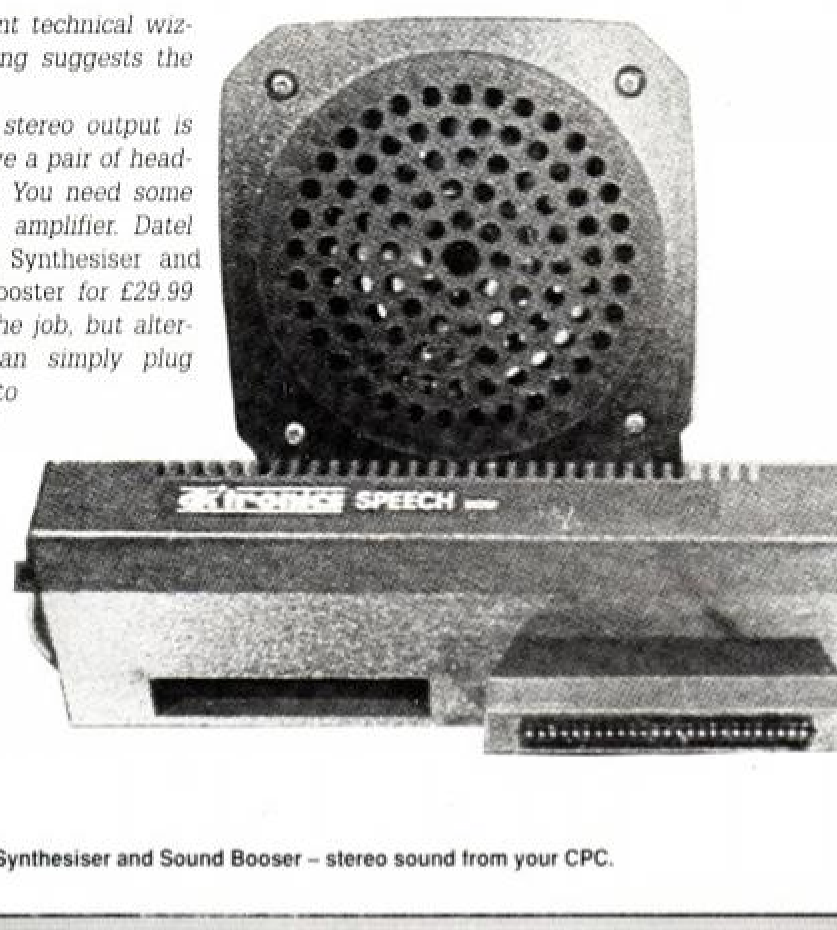
●Ear, ear

For some time I have wanted to buy stereo headphones for my CPC464, so I was very disappointed when at the *Computer Shopper* Show I kept being told there's no such thing, yet I'm sure I've read somewhere it does exist. Can you help please?

Mr G Baker
Northampton

AA: *Our resident technical wizard Adam Waring suggests the following:*

"The CPC's stereo output is too weak to drive a pair of headphones directly. You need some sort of external amplifier. Datel sells a Speech Synthesiser and Stereo Sound Booster *for £29.99 which will do the job, but alternatively you can simply plug your CPC into any hi-fi and boost its output that way."*



● Datel's Speech Synthesiser and Sound Booser – stereo sound from your CPC.

●A pedant writes...

Someone wrote in *AA*50 about Trenton Webb being a space marine. He could well have been one. I could tell you of the experiences of being a space marine, as could a couple of mv mates. The game *Laser Squad* is a spitting image of the games that *The Games Workshoo* makes. In which space marines take part. About 99% of them. They are claimed to be RPGs, but aren't really – they are just tactical boardgames. So if you like *LS* then pop down to your local *GW* with £20 in hand and become a space marine! (*Space Hulk* springs to mind, so does *Blood Bowl*, but there aren't any space marines in that.)



Why do you let TW do games reviews? In every one there is a whole column of waffle before he describes the game. He then says what you do in it and that's it, no more space left. You are none the wiser after reading the review, you will know if it is good or bad but you won't know what is involved in playing the game so you are still undecided.

He also didn't explain what opportunity fire was in *LS*. For all you poor, frustrated soulds out there, it is fire that you can use while it is not your turn. When someone crosses your line of sight, whether it be friend or foe, you pull the trigger in a "rash adrenaline-fired action" (some poet or other). It is when someone crosses your LOS (line of sight), not AOF (arc of fire) as if someone is in your AOF then that doesn't mean you can see them.

Adrian Forbes
Gourock, Scotland



● Trenton Webb in a rare moment of relaxation (artists impression).

AA: Waffle? Trenton gets to the point quicker than you do, chum. By the way, you don't get the chance to shoot your friends in Laser Squad, *at least not with Opportunity Fire. We suggest you check the manual again.*

●Congratulations all round

Firstly, I would like to say how good your magazine is and that I think it is the best magazine out. I will buy it for as long as it lives!

Now I've got that out of my system, I want to congratulate the Pilgrim (or should I say Balrog?) on coming back into the magazine. This is one of the many reasons I buy the magazine, and think it wouldn't be the same without it.

Also, I would like to congratulate Joan Pancott on how many advetures she has completed, and to thank her because she has helped me more than once on *Kentilla*, although I see that many people have completed the game. Hmmm... is it just me?

Second to last part of my praising, I have never seen any magazine so generous! First you do the massive *AA Birthday Competition*, then you give us the chance to go around some whopping great show to collect as many things as we can.

In the final part of my letter, I am pleading to those much-loved adventure writers Level 9. Please, please, please don't drop the 8-bit computer, whatever you do! Loads of people out there buy your software. I for one am buying your new release *Scapeghost*. So, for all us adventurers, keem paming 'em – you know it makes sense!

Jamie Tillman
Doncaster



● Balrog: the fan mail pours in...

AA: Gosh, er, thanks Jamie. The fact is that AA couldn't afford to be half as generous if the manfufacturers themselves weren't so helpful. As for Level 9 quitting 8-bit adventuring, we're very much afraid the lads have made their minds up, and that's it.

●More tapes?

I buy your mag every month and there is no part of it that I do not like. But there is one thing that I do not understand, and that is why, when I see all the other mags on the newsagents shelves have got free tapes on the front nearly every month, yours does not except on special occasions.

For one thing, the *Cheat Mode* and tips pages are always saying that because of limited room we cannot print them all. Why not put this part and a few others, such as readers letters and reviews of games, on a the covertape?

It would not bother me to pay a little bit extra to help cover the cost of making the free tapes, but I suppose some people would argue that if they have to pay more then this would mean the tape was no longer free.

At the moment, we get one on *AA*'s birthday and another at Christmas, whereas *Sinclair User* (yuk!) and *Crash* (wash my mouth out with soap) give their readers a free tape every month. Considering Amstrad and Spectrum are now part of the same company, in my opinion Spectrum owners are getting an advantage that we Amstrad owners are not.

I await your reply with bated breath. If you don't reply I shall stop buying *AA*.

AA: We have made a conscious decision not to mount tapes on the cover of every issue. The correspondence we get from our readers as a whole suggests that they'd rather pay less for the majority of issues and get a really good covertape now and then, rather than pay extra each issue and run the risk of mediocre covertapes. As for putting some of the pages on a covertape, that wouldn't be terribly efficient! The printed word is still the most efficient way of passing on information.

However, the question of putting tapes on the cover more frequently is being discussed even as we speak...

●Author's Note

Many thanks for featuring our software [*Home Executive Suite*] in the January issue of *Amstrad Action*. I do have some comments on the write-up.

Firstly, we agree that the personal accounts ledger is the most powerful component of the package. However, I'd like to reply to some of the criticisms. As you rightly said, the filer was intended as a sort of computerised card box. Even so, it has useful features such as a totalise function, sort codes and the facility to print out cards with the data in any order required. I feel it was rather harsh to bemoan the lack of complex database functions in a program which was designed for simple filing tasks. However, we plan to upgrade the package in the New Year and will look at the possibility of introducting a multi-level search as suggested in the report.

Secondly, two of the elements in *Home Exec* were described as "unnecessary and useless". The Shopper isn't just a slick alternative to pen and paper as a way of writing out a shopping list. The program acts as a *reminder*, allowing the user to scroll through the file selecting items with a few keystrokes. The advantage the calculator has over its hand-held counterpart is a printer option, thus allowing its use as a simple add-lister.

I was disappointed that *General Ledger 6128* was only allocated a tiny info box. As a major accounting package for the CPC (described by Adam as a "fully-fledged business ledger" I hope you will consider covering the program in more detail in a future issue. As boss of one of the leading serious software houses for the CPC I can confirm there is massive interest in this area of the market.

Finally, congratulations on *AA*'s biggest ever issue and long may your magazine and the CPC continue.

Steve Denson
SD Microsystems

Only last Saturday I witnessed one of these displaying all his mastery on a 6128. A lady had returned some software to the shop saying it would not load. The title is irrelevant, but it was a disk game.

He first attempted to load it using the "RUN DISC" command on the inlay card, and when that wouldn't work he explained that sometimes the computer benefits from being "reset", and I watched stupefied as he promptly switched it off at the back *several* times, *without* removing the disk.

It was at this point that I suggested he not continue with that practice but try instead the "|CPM" command.

Not surprisingly, it worked, and the lady went away quite happy. What I would like to know is why do software companies continue to put incorrect information on inlays?

As a matter of help to any *AA* readers I can say that the Activision game *Timescanner* doesn't load by the method stated in the inlay, but runs perfectly with |CPM.

Would it not be an idea if someone at *AA* could produce a beginner's guide to software, explaining things such as:

1 Don't switch off the computer with the disk in

2 Try more than one loading method – the inlay is often wrong

3 How to use *Disckit3* to make back-up copies (I know you can't do this with protected software, but with many adventures and much serious software you can.)

Although the manual supplied with any Amstrad covers some of these, and other points, who *really* looks at the book when all you want to do is play games?

In fact, I would lay money on the fact that if you displayed something akin to "The Beginners' Guide to Loading and Running Licenced Software" on the cover of an issue, you would notice an increase in sales. Let's face it, *everyone* has had trouble at some time with loading.

The games playing fraternity may be discounted by many as morons, but when all is said and done they *do* pay the wages of software companies and magazine editors.

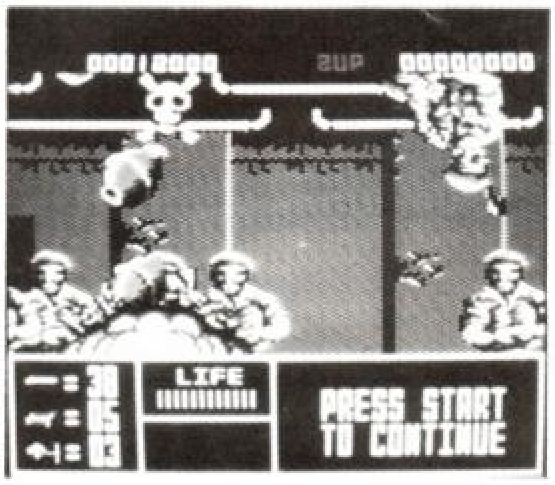
Onto the next subject – editorial copy. So far there has been a marked absence of words such as "mega", "fab", "brill" and any combination of these and more. Also, still no "soft" swearing creeping in. I am impressed – keep it up! As a long-term owner of a 48K Spectrum (don't laugh, it got me started didn't it?), I have witnessed the shocking demise of the Newsfield giant *Crash*.

There was once a time when I suffered withdrawal symptoms if my subscription copy was late! Now? Well just look at it! Similarly, *Your Sinclair* and *Sinclair User*, though they were already half way there when *Crash* first came out.

I wouldn't be surprised if the editorial staff at *AA* are too young to remember the first few issues of *Crash*, so won't know what I'm talking about. Just believe me, as soon as you start letting in daft, pointless ego-tripping letters and editorial copy you will be unable to stop it.

Please therefore keep up the excellent content and see if you can find some more room for *Balrog*, and perhaps some for simulation/strategy tips and reviews.

Dave Havard
Fareham, Hants



● Are licensed games just mindless violence?

AA: We didn't think there was much at the Shopper *Show either, but then it came over as being more of an event for bargain-hunters than a showcase for the industry. As for 16-bitters coming down to our level – what do you mean? They've got some climbing to do yet, pal! Regarding your points on a beginners guide to loading software, we may well tackle that subject in the near future, since quite a few people how now raised the same topic.*

However, as for the games playing fraternity being discounted as morons, we want to know WHO SAYS SO? (Many of my best friends are games players and only a few of them... etc).

●Outrageous plug

If any readers are interested, I have typed in over 100 short magazine programs which I will be happy to send anyone if they send me the following:

1 A blank disk (disks only)
2 An SAE
3 £1 (copying charge)

I will also send you a 15K unpublished program of mine called *Picture Pairs* (a 2-player game).

The programs are varied and interesting and are a nice way to pass a couple of hours on a winter's afternoon.

David Hall
12 Stothard Road,
Stretford,
Manchester M32 9HA

AA: Sounds fair enough to us. Hang on, though, maybe we should charge you £5 for placing a small ad. OK – just don't do it again...

●Canon fodder

Every so often someone writes to you praising this or that manufacturer for the quality of its service. I'm not.

In 1984, I bought a Canon PW1080 printer (it's the same as the Kaga Taxan), and was very pleased with it. Eventually, I damaged it using sticky labels for letters. There's a little strip attached to the platen that holds the paper tightly against the roller, ensuring high quality print, and it finally became detached. It looks to be a very easy repair – if only I could get the part.

And that's the point! Because I am not a massive company, with a massive contract to offer, with massive profits, no-one who repairs Canon printers is willing to help me. Eventually, I phoned Canon UK, and an apparently sympathetic person made one or two suggestions. I followed them up, but still got nowhere, so I wrote to Canon – in September – thus:

"I still have had no success. It seems that unless I am prepared to fork out about £70 to have a very simple repair done, I am not going to have any luck.

My 'local' Canon shop can't help me: Microperipherals' 'local' shop has gone bust: no-one will send me a technical manual so that I can identify and order the part myself.

I fell that the quality of customer service offered me has been appalling. I may only be one individual customer, but Canon's business ultimately depends on individuals and on its reputation. I think I deserve rather better than I have got."

And so I still have not got my printer repaired – after trying for TWO YEARS!

Perhaps you could warn your readers, because I know they are almost all mere (!) individuals like me, with limited budgets, that if they invest in an expensive peripheral, like a printer, to make sure that they buy from a responsible manufacturer which does not take the view that if one of their machines goes wrong the proper course of action is to throw it away and spend another £400 on a new one!

David Meredith
Coventry

AA: We think you're being a bit hard on Canon, David. You're not being asked to throw away your machine and buy a new one, merely to return it to an authorised repair centre.

Having said that, such repairs do tend to be expensive, and with most other products you can obtain the spares you need to make your own repairs.

We phoned Canon to find out whether individuals could order parts themselves and they told us no. Only dealers could order spares. We then tried Microperipherals, which explained that faulty machines would have to be returned to their repair centre.

Finally, after calling half a dozen different numbers, we were put in touch with First Choice Micros in London. We explained your problem and the solution was instant. First Choice doesn't provide spares catalogues, but if you send in your faulty component it will be identified and then replaced.

The address is ***First Choice Micros, Unit S, Tech West Centre, 10 Warple Way, Acton, London W3 0UE****. The telephone number is 01 992 2512.*

And say that AA sent you!

BROADLEY SPEAKING



This month EMMA BROADLEY frets about 6128 ROMs, fumes over Christmas and fulminates over licences...

Upgrades banned! So reads the headline in *Amscene*. So what are we to make of this latest piece of CPC foolishness? Somehow or other, the industry seems determined to dig its own grave and then climb inside!

Although, to be fair, you can see both sides of the argument. Amstrad is understandably happy to sell the ROMs on their own, while Locomotive could be expected to want a slice of the action – or put a spanner in the works if it's not forthcoming. In fact, it's just surprising that the whole thing should have taken so long to come to a head.

The worst thing of all, of course, is what this will mean to the CPC. Quite a few people will have bought a 464 when money was tight, secure in the knowledge that they could upgrade to 6128 spec when they liked. Not any more.

The reason I'm so annoyed is that one of my own machines is in fact a 464. Now I do most of my work on a 6128 now, of course, but that's part of the reason the latest news has come as such an annoyance – I want to use the same software on both!

Now I hadn't exactly set a date when I was going to get my older machine upgraded, but at least I could content myself with the knowledge that I could do it more or less at any time. Now, I'm beginning to wonder if my trusty old 464 is destined instead for that great interface in the sky!

The great divide

Apart from anything else, the whole business is going to widen the gap between the 464 and 6128 even more. Already, 6128 owners complain (I must admit I've done so more than once myself) that their machine is not getting the quality of software it deserves because progrogrammers are always writing for the lowest common denominator – the 464.

But what's the solution? Phase out the 464? Surely not, because as the cheapest CPC it represents an affordable introduction to the CPC range in a market where money is traditionally tight – i.e. for schoolkids. Maybe one solution would be for Amstrad to "slightly" upgrade the 464 to 128K? It surely wouldn't add much to the price – maybe another £20? – but would immediately give software developers just one specification to aim at. Maybe then we could expect to see more – and better – 128K software.

Kiss and make up

Of course, a far better short-term solution would be for Amstrad and Locomotive simply to settle the whole thing amicably. The worst possibility is that Amstrad will simply not be bothered enough about sales from individual 6128 ROMs to agree a deal.

Broadley Brickbats

Any reader wishing to take issue with Ms Broadley on any of the opinions expressed in her column may write to the following address:

Broadley Brickbats, Amstrad Action, Beauford Court, 30 Monmouth Street, Bath, Avon BA1 2AP

We have been advised to point out by the National Health Advisory Council that sixteen weeks in traction is not a lot of fun.

POST-CHRISTMAS RUSH?

Now I'm the last person to run Christmas down – after all, it's about the one time of the year when everyone puts aside their differences (or ought to!). Nor am I going to complain about the outragous commercial hyping around this time of year. No, what really gets my goat is the way the entire industry gears itself up for one single, annual push and then stops.

As you may have guessed, I'm talking about the post-Christmas lull. Understandably the software houses concentrate on getting all their top games out for Christmas, but have they never heard of the phrase 'Granny money'?

Although parents buy their kids games for Christmas – probably in the one last, headling rush the manufacturers end up in – but a lot of kids also get money from their relatives for Christmas. (Probably after complaining about the horrid fluorescent double-kint Fairisle sweater they got last time).

Basically, once Christmas is over, there's more cash out there in the hands of CPC owners themselves than when it starts. Which is why this sudden suspension of activity in the CPC market at this time of year is not just an annoyance for us CPC owners, but a commercial nonsense!

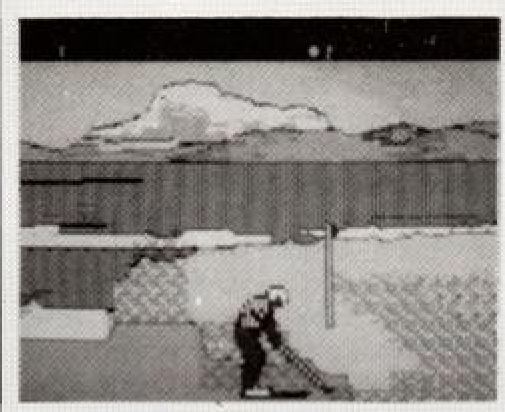
Of course, maybe this year the industry will wake up to the fact that computing goes on all year round. We shall have to wait and see...

Hole in one!

I just couldn't let this month go by without mentioning *Jack Nicklaus Golf*. Ignoring the fact that it's another computer title that represents the computer industry's resolutely male-oriented outloook (!), it's simply an excellent game.

It's not just that I'm a golf fanatic (I shudder to think how much I paid out in club fees and new equipment last year – though I'm sure my accountant could tell me). Quite simply, Accolade has turned out a golf sim that actually looks like it takes place on a golf course! The backgrounds are quite superb, and although they take a while to draw each screen, it's worth the wait. Golf, after all, should be a leisurely, considered activity.

And what a change it makes from mindless alien-bashing, thug-kicking and car-wrecking.



LOSE THAT LICENCE!

No, I'm not advocating everyone should drink and drive – that's the last thing I'd do! Instead, I'm just asking the question, is it me, or are licenced games just boring, shallow apologies for real games?

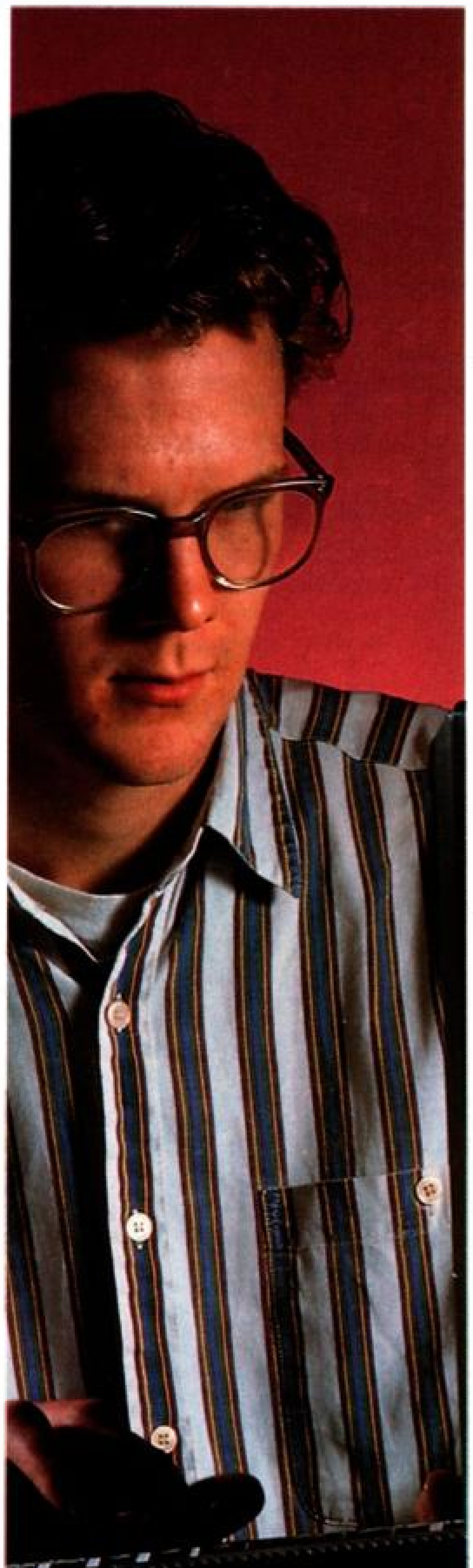
Maybe it's just because software houses have been aiming at the Christmas market, but it seems at least half the games coming out now are licences of films or arcade games, and in every case, it seems to me, they simply don't produce proper computer games. Films should be enjoyed as films, while arcade games are surely most fun when *played* in the arcades. Neither, in my opinion, translates properly onto the home micro.

What happened to *originality*? Why don't people write games like *The Sentinel* or *Spindizzyany* more? Maybe I'm just getting old...



OPERATION THUNDERBOLT
BLOCKBUSTER FOLLOW-UP TO LAST CHRISTMAS'S No. 1 HIT... OPERATION WOLF...
NOW WITH TWICE THE ACTION, TWICE THE FUN, TWICE THE CHALLENGE
ROY ADAM IS BACK!
The Hi-jack report came from a DC10 leaving Paris for Boston – Arab guerillas were in control of flight 102 and had turned the aircraft towards Africa ...The plane lands in hostile territory and the terrorists begin their demands...
USE THE LASERSIGHT
or the bulletproof vest, but watch out for
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Software at the speed of light!



Fancy near-instantaneous loading? Twice as much free RAM? If you thought chip-blowing was just to stop your gob getting burned, read on, as ADAM WARING delves into the mysteries of EPROMs...

The types of memory inside the CPC fall basically into two categories – the oh-so-similar-sounding ROM and RAM. Both consist of silicon chips containing large numbers of individual, microscopic circuits, each of which can be set to one of two states – on or off – hence the binary nature of computer operations. However, both in the manufacture and function, ROM and RAM are quite different.

The circuits in Read Only Memory (ROM) chips are irreversibly 'wired' on manufacture so that they contain a permanent series of instructions or set of information, even when their power supply is switched off. When installed, these chips can be thought of as the computer's instruction manual.

Random Access Memory (RAM) chips are

THE TOOLS OF THE TRADE

For the purposes of this article we used the Microgenic Systems Eprom Programmer. This device is capable of programming all 8K and 16K EPROMs that can be programmed with a 12.5 volt power source (some older chips require higher voltages). The board features a reset button and a Zero Insertion Force EPROM socket, and comes complete with a power supply and controlling software on ROM. The unit is really of top quality design, and the only one on the market that lets you insert EPROMs whilst the unit is powered up.

Microgenic's ROM board can be bolted directly on to the unit, providing a very stable set up. It can hold up to eight ROMs at once, and features include the ability to select ROM space of either 0-7 or 8-15, as well as a switch to completely disable all the ROMs.

The accompanying software is very easy to use. It sits in a socket on the ROM board and is accessed by typing |BLOW. It's capable of checking EPROMS to make sure that they're empty, copying ROM to EPROM and RAM to EPROM. You can also copy the contents of the EPROM to RAM, and there is a screen dump feature to give a picture of the EPROM's contents. You can even place a ROM in the ZIF socket, copy it to memory, insert your EPROM, and re-copy the memory back to the EPROM. Very useful indeed if you want to make a quick copy of one of your EPROMs without the hassle of plugging it into the ROM board.

The actual procedure for blowing ROMs couldn't be easier. Following is a step-by-step guide: (Different EPROM programmers may have slight variations in their use)

1. Plug the accompanying ROM software into your ROM board and plug the EPROM programmer into the back of the computer. Connect the external power supply to the programmer.

2. Load the software you want to blow into ROM into the computer's memory from BASIC. Address &4000 seems a sensible choice.

3. Type |BLOW to initialize the Programmer software. The board is kicked into action, and the socket is made safe.

4. You now have a choice of what kind of chip to program. Choose between an 8K or 16K chip.

5. Select the type of programming method. The first is a 50ms method which applies a high programming voltage to each memory location in turn, for a fixed period of 50 milliseconds, regardless of the data being sent. The second type is the *'intelligent' algorithm, which applies the voltage* for just the right amount of time, depending on how long it requires to program the data. This method is by far the faster of the two, but may not work with certain makes of chip.

6. Now is the time to plug your EPROM into the ZIF socket. Pull the lever into the up position, drop in the chip, and close the lever to hold it firmly in place.

7. At this stage you may well want to check out the EPROM to see if it's ready to be programmed. The blank test option tells you whether it's erased or not.

8. Select transfer data. You need to tell the computer whether to copy from another ROM or from RAM, and the Start and destination addresses.

9. Sit back and watch the software do the rest.

HOW TO SET UP YOUR ROM

If you're thinking of putting your latest BASIC masterpiece into ROM then forget it! Your program will need to be in machine code – either written on an assembler, or a compiled programming language. An important factor to bear in mind is that the EPROM itself won't have any spare memory to store variables, so you will need to set aside a bit of RAM for any changeable data.

The CPC is particularly well suited to using ROMs, as it has all the necessary firmware built in to select them. The RSXs are an ideal way of accessing your software, as they contain all the paging software needed to physically switch the ROM into place, and they also include built-in error-checking routines.

An RSX, for those who don't know, is a Resident System eXtension. It's basically a neat way of calling machine code routines by simply typing a relevant routine name. It's a powerful enough feature with RAM-resident applications, but it will also check out the ROMs for any in-built names, making them a delight to use. For the user it's an extremely easy and user-friendly way of accessing the programs, but the coder has to set up quite a complex table to access the routines, which are of course, quite transparent to the user.

```
Set up your EPROM like this:
            ORG     &C000       ;ROMs page into this address

            DEFB    1           ;Signify background ROM
            DEFB    1,1,1       ;ROM version references

            DEFW    nametable   ;point to table of RSX names

;Start addresses
            JP      initialize  ;The ROM initialization pro-
gram
            JP      prog1       ;first program address
            JP      prog2
            ...
            JP      prog20      ;Last program address

;RSX names
nametable   DEFB    "AA ROM"+&80  ;Initialize routine name
            DEFB    "AA1"+&80     ;First program name
            DEFB    "AA2"+&80
            ...
            DEFB    "AA20"+&80    ;Last program name
            DEFB    0             ;End of table marker

;Initialize routine - sets up ROM
initialize  PUSH    HL
            PUSH    DE

            CALL    print       ;text printing routine
            DEFB    "AA ROM initialized",0

            LD      DE,100      ;reserve some RAM
            SBC     HL,DE

            POP     DE
            POP     HL
            SCF
            RET

prog1                           ;Your programs start here...
```

quite different. Their microscopic circuits are not set to any particular value – they can be reset electrically. These chips can be thought of as a computer's notepad, or blackboard, where it jots down temporary bits of information. It's in the nature of blackboards that you should need to clean them when you want to write something new. The problem with RAM chips is that they get wiped every time the power goes off – switch off the computer, and the entire contents of the machine's memory are 'forgotten'.

The more permanent ROM-type memory is extremely useful. The CPC's own ROM contains a program that controls the operations of the computer. Whenever you turn on the CPC the computer jumps to the ROM and sets up the system. When you type a line into the CPC the program in the ROM directs the processor to read the keyboard, print the characters on the screen, interpret the commands and act upon them. In the case of the disk drive it pages in another ROM which handles all the disk operations.

But the machine's RAM is the only memory that's alterable by the user. When you load in some software or type in a program, it's stored in the computer's RAM and stays there until the computer is switched off or reset. The monitor display is provided by a bank of RAM connected to a video chip – a device which converts the memory contents into a video image.

The upshot of all this is that any software you use or write needs to be loaded in every time you want to use it. Of course, if you have a program or utility that you use often or find particularly useful, then it can be a nuisance to have to load it in at the start of each computing session. It would be far more helpful if the software could be stored it on ROM, just like the CPC's own built-in software, ready to be accessed instantaneously whenever needed.

Halfway house

This is where EPROM chips come in. EPROM stands for Electrically Programmable Read Only Memory. Once programmed, EPROM chips store information permanently just like ROM chips, but can be written to as well like RAM chips.

Or *almost* like RAM chips. Conventional RAM can be erased electrically – as you use the computer, the RAM is constantly being updated with fresh information. The price paid for the permanance of EPROMs is the fact that erasing and writing are two quite different – and rather more involved – procedures. You can write information to an EPROM only once it's been completely erased it. This is achieved by exposing the EPROM to an ultra-violet light source. A window on the top of the chip allows the light to shine on the UV-sensitive material that the integrated circuit is constructed from. The resulting photochemical reaction resets all the bits on the chip, having the net effect of completely wiping the stored data. After erasing, the window is covered with a sticker to prevent any further – accidental – erasure from stray light.

Life in the fast lane

The main advantages of having software on ROM are threefold. Firstly, data integrity is extremely high – you don't get load errors on ROM. Secondly, the programs can be accessed instantaneously, simply by typing a keyword. Thirdly, the computer's RAM is left free – either for other programs, or to be used by the ROM application. For example, the standard disk-based version of *Protext* leaves only 23K of memory for text on a CPC, whilst you have nearly 40K free on the ROM-based version. (A

ROM FOR IMPROVEMENT?

It might sound as if saving all your favourite applications onto ROM is the ideal solution for all those loading blues. Even disk-based software can take an infuriating 30-60 seconds to load in, while tape-based software is slower still.

Unfortunately, you can't just save your favourite programs onto ROM chips and run them from there. The technical problems are not insurmountable, but they're complex enough to make the feat not worth attempting.

Firstly, software loads to predetermined addresses in the computer's RAM. If software is simply transferred to ROM chips, all the addresses will be well and truly mucked up.

Secondly, programs will often be configured to store variables and other bits of information within, or near to, the program. You can't write to ROMs, so this will stop the software working.

Thirdly, because of memory address problems again, it's really only pure machine-code (or code written in BASIC and then compiled) that can be stored on ROM chips. Quite a lot of software contains some BASIC – even commercial programs.

However, the good news is that there's enough commercial software available on ROM to make the investment in a ROM board worthwhile, even if you've no intention of developing your own ROM software. The following are just a few of the packages available:

- ***Protext*, Arnor's excellent word processor**
- ***Prospell*, *Protext*'se companion spell checker**
- ***Promerge*, a mail-merge add-on for *Protext***
- ***Maxam*, a powerful machine code assembler**
- ***Comstar*, a versatile comms package**
- ***Romdos*, *Rodos*, extended DOS packages**
- **CPM, the operating system used by much commercial and public domain software**

All of the above are leading programs in their areas, and all are *extremely* useful to have on ROM – remember, they not only load virtually instantaneously, hence acting almost as 'pop-up' utilities,

number of software companies sell their programs on tape, disk *and* ROM chips.)

What kind of programs lend themselves to implementation on EPROM? Two main categories spring to mind. Application programs like word processors and assemblers – they take advantage of the free space left in RAM to increase the area you can work with. The other is utilities such as disk operating systems and extended BASICs. You want programs like these to improve the machine's performance without either slowing it down or taking up memory.

Bits and pieces

To use EPROMs you will need two things:

- An EPROM 'blower' – the device that lets you program the EPROM in the first place
- A ROM board – somewhere to mount the programmed EPROM so that you can access the software

Optionally, an ultra-violet eraser is useful for erasing chips and subsequently re-using them. Proper EPROM erasers consist of a UV tube and a tray to put the chips in. These devices are capable of erasing several EPROMs at a time. If you don't want to stretch to a dedicated EPROM eraser, however, half an hour under a sunbed (the chip, not you!) will do the job.

Good EPROM blowers consists of a board with a special type of IC connector called a Zero Insertion Force socket (ZIF to its friends). The chips are simply dropped into place, and pressing a lever on the socket crimps the pins, holding the EPROM securely in place. External software is used to activate the device and copy data into the EPROM.

The ROM board is used to access the software once it has been programmed. ROM boards usually have six to eight sockets, enabling several ROMs to present at once. A set of dip switches allows you to switch the ROMs on and off. ROM boards (ROM *boxes*, usually) simply plug into your CPC's expansion port.

Running the software from the ROM board couldn't be easier. When the computer is switched on it checks out all the ROMs available, and will execute the in-built initialization routine in each one (which reserves the ROM's 'workspace' in he CPC and prints a sign-on message). From then on the ROM commands are easily initialized via an RSX – by typing a single keyword. For instance, if you had an assembler on ROM you could enter it with |ASSEM, or even just |A. An extended BASIC would have several new keywords, and all could be called up with this simple system.

Much ROM-based software is available commercially. These 'ROMs' are generally EPROMs in disguise, as it only becomes commercially viable to produce "real" ROMs in vast quantities. If you don't plan writing your own programs on ROM, but would like to use some of the wealth of pre-programmed ROMs available, obviously all you'd need is the ROM board itself. However, if you want to get down to the business of producing your own silicon software, then what are you waiting for...?

IN FOR A PENNY...

The equipment needed for producing EPROMS is not cheap, so you'll need to be fairly serious before splashing out the necessary cash. Microgenic Systems' price list is a good guide.

- EPROM PROGRAMMER £69.95
- ROM BOARD £34.95
- EPROM ERASER £22.50
- 8K EPROM £5.95
- 16K EPROM £6.95

You can contact Microgenic Systems at The Brampton Centre, Brampton Road, Wath-Upon-Dearne, S63 6BB. (0709 876743).



COMPETITION!

Can't scrape together the necessary cash for an EPROM blower? Well don't say we never look after you, because we're giving away a fabulous Microgenic Systems EPROM programmer and ROM expansion board – between them worth over £100!

As ever, all you have to do is answer a few questions, just to make sure you're on the ball:

What kind of light erases EPROMs?

A) Infra-Red
B) Laser
C) Ultra-Violet

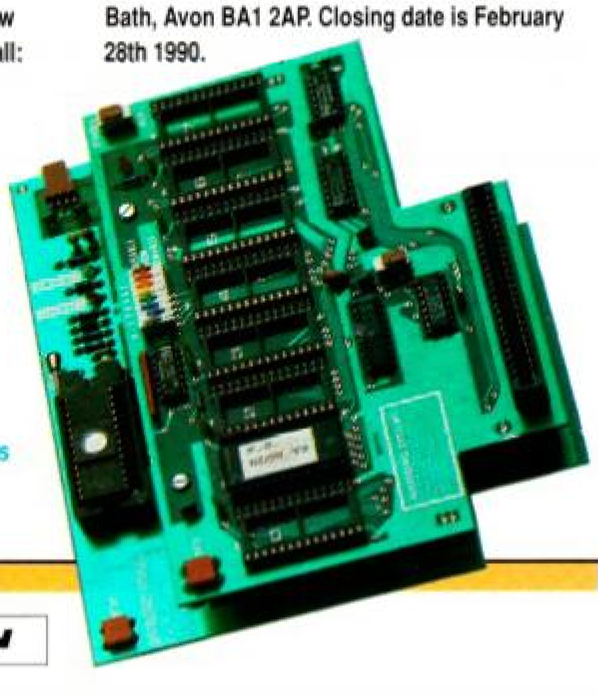
What does ZIF stand for?

A) Zinc Interface Flexibility
B) Zero Insertion Force
C) Zilog Instruction Feeder

How many ROMs will the Microgenic Systems ROM expansion board accommodate?

A) Twelve
B) Eight
C) Six

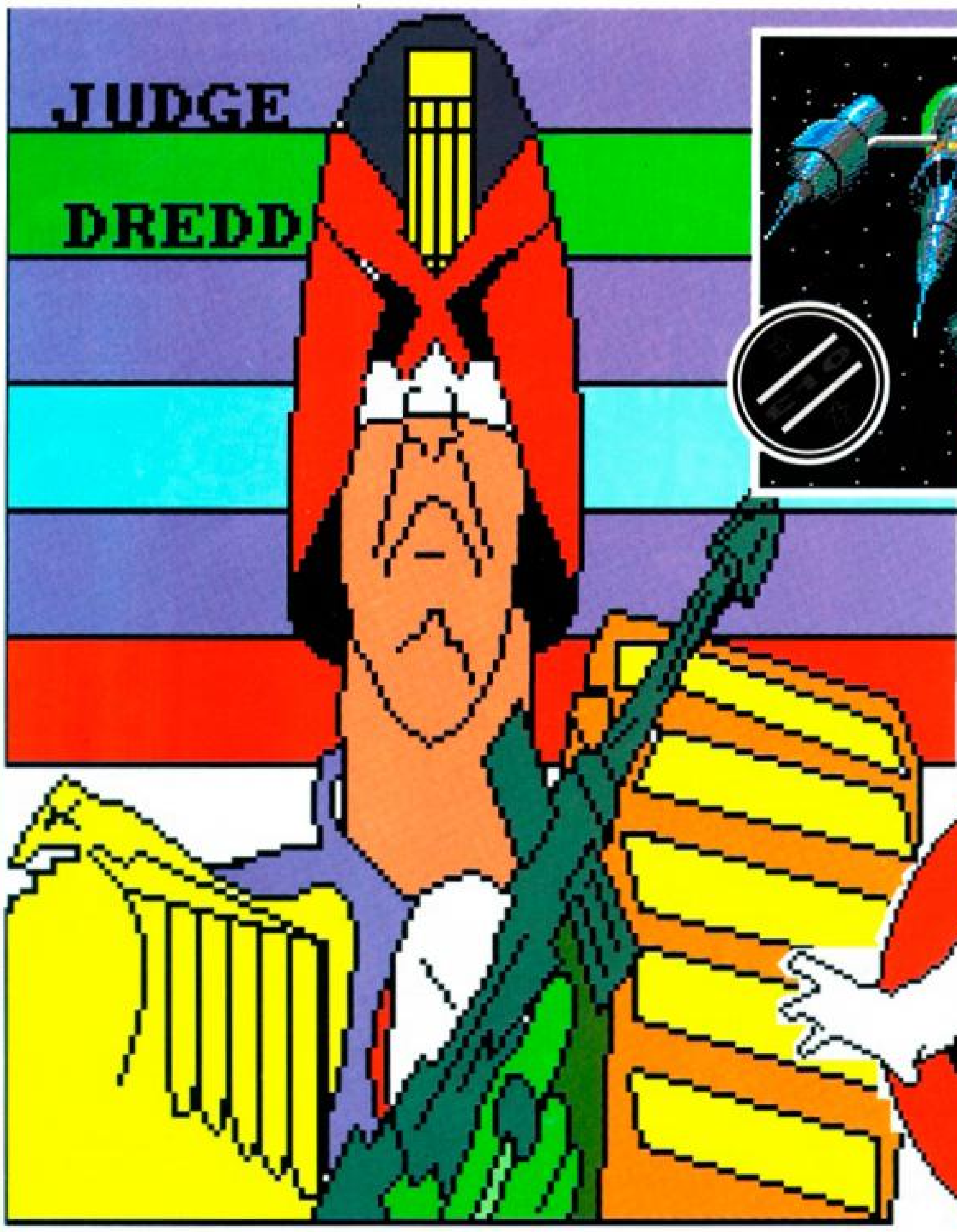
Got that? Right, just send your answers in on a postcard to EPROM COMPETITION, Amstrad Action, Beauford Court, 30 Monmouth Street, Bath, Avon BA1 2AP. Closing date is February 28th 1990.





INCREDIBLE BUT TRUE!
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ACE MAGAZINE • DECEMBER 89

THE GALLERY





● David Ware of Fareham has been inspired by the '70s classic sci-fi TV series *Blakes 7*. Simon Buncher provides the most feared law-man of the all, Judge Dredd, drawn on *Parroty*. C Dawson ain't afraid of no ghost, and has sent in his rendition of the *Ghostbusters* logo.







● The dragster comes courtesy of Manjit Tara, and Nicholas Keeling brings a bit of seasonal spirit with his Chismas picture.

● Garfield goes ski-ing from Manjit Tara of Birstall. Pluto comes from Nicholas Keeling. That stone-age superstar Fred Flintstone was drawn on *Art Studio* by David Ware. Cartoon capers abound from Simon Cartwright.









● All you great CPC artists out there stand to win yourselves £20 *and* the eternal glory of having your pictures printed in *AA*.

So send those piccies in to the address below, together with some brief notes on the paint package and any special techniques you used – and don't forget enclose an SAE if you want your disk back.

Adam Waring,
AA Gallery
Future Publishing
Beauford Court
30 Monmouth Street
Bath
Avon BA1 2AP

FORUM

Think you've got problems? ADAM WARING has all the answers...

●Mismatched ideas

I have a CPC464 with a disk drive and printer, and have been trying for a long time to print out a list of all the files on my disks.

Ivan Fontaine's program *Dirprint (AA50)* seemed to be exactly what I was looking for, but comes up with the error TYPE MISMATCH IN LINE 50.

I have re-checked the listing several times, but can find nothing wrong with the program.

Please could you help by printing a suggestion or listing that will work on my 464.

T.F. Woods
Thorpe St Andrew
Norwich

Ivan's listing will work on your 464, and it was printed without any errors. The problem lies in your typing, I'm afraid.

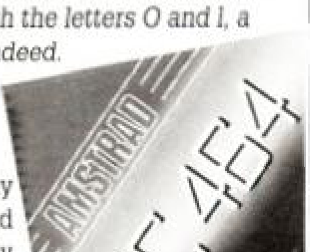
The TYPE MISMATCH error can be a little misleading. The error means that the computer was expecting a number, but instead encountered a letter. It occurs most commonly with DATA statements.

The typing error won't be in line 50 at all, instead it will be lurking somewhere in all those DATA statments in lines 100-480. Hex digits are made up from numbers 0-9 and letters A-F. Anything outside this range will cause the error. In particular, you should make sure that you haven't replaced the numbers 0 and 1 (zero and one) with the letters O and l, a very common mistake indeed.

●Manual labour

Help! I have recently bought a second hand CPC464 – unfortunately without the manual.

Does anyone have this booklet that they no longer need? I can't seem to get hold of one.



● The Manual – essential reading.

Ruth Starbrook
London

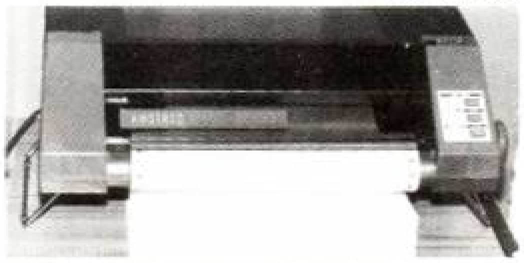
If anyone has an unwanted manual please get in touch. In the meantime, Ruth, you may consider getting one of the wealth of books for beginners on the CPC. In particular, Starting Basic *by Sean Gray and Eddy Maddix, published by Glentop, ISBN 0-907792-39-1, is a recommended beginners guide to the delights of CPC computing.*

●Down in the dumps

I've recently purchased a 6128 which I am very pleased with, except for one or two things. Firstly, I find the instruction manual very difficult to follow as it keeps jumping from one section to another with bits of information scattered thoughout.

Secondly, I have been unable to find out how to do a screen dump to the printer. I can print out a program listing, but would like to print hard copies of diagrams and graphs.

Steve Cocker
Huntingdon



● No need to dump your printer after all.

There is no facility to print out screen dumps from BASIC, I'm afraid. The method I use is to save the picture to disk, with SAVE "pic",b,&C000,&4000. Load the picture into an art package such as Art Studio, *and print it out from there.*

Persevere with the manual, Steve, you'll get there in the end.

●Super savings

£10

I have a useful hint for Multiface users that I thought I'd share with your readers. You all know that Multiface II+ does not save all your games properly and some of them will crash (*Bubble Bobble, Super Hang-on*). I have found a way around this:

1. After a failed attempt at loading the desired game – and you're sure it was the fault of the Multiface – reset the computer.
2. Press the red button, but don't take your finger off.
3. Press the reset button and let go, still keeping your finger on the red button.
4. Let go of it now, and the computer should either reset to BASIC, or press 'R' for return, and then it should reset.
5. Load the required game straight away.
6. When it has loaded, press the red button (followed by Clear if it is not a 6128-only game), and save to your disk straight away. Switch the computer off and then load in from your saved disk.

This should work for everybody with a Multiface II+. It works for me, and I now have just about all my tape games on disk.

Mirek Slobodzian
Swindon

Thanks for the tip.

●Rounding off

Firstly, congratulations to Andrew Hodgson for *Easi-sheet*, one of October's freebie progs. A very useful program, except for the fact that the number rounding routine doesn't appear to work.

Having tried to subtract 648.72 from 703.09 I get the answer 54.3699999! I hope this fault of Amstrad BASIC can be rectified.

Can you suggest how this may be cured, as otherwise this is going to prove a real pain if I have to alter the answers each time.

L Lee
Brixham

Rounding errors are a common fault in home computers. I could launch into a long and boring discusion explaining exponents, normalized mantissas and fixed floating points, but instead I'll settle for saying that fractions can be inaccurate.

A commonly-used method of getting round the problem is to get rid of the fractions. If the numbers you are using only need to work to two decimal places then it is a good idea to multiply the numbers by 100 before any calculations are made. This routine takes your example numbers and prints the correct result.

```
10 a=703.09:b=648.72
20 a1=a*100:b1=b*100
30 c1=a-b:c=c1/100
40 PRINT c
```

●Small Wonder

Could you please tell me where I could get hold of a program to save files onto tape. I have no previous knowledge of saving files.

Alex Small
Kilmacolm
Renfrewshire

A book comes with the computer, Alex, called The Manual. *It doesn't make for interesting reading (it has a very weak plot!), but it's invaluable for learning how to use the machine. Inside there is a whole chapter devoted to using the tape recorder.*



● Saving to tape is easy when you know how.

To save a BASIC program, all you need to type is

```
SAVE "filename"
```

●Numbers up

I was wondering if you could help me with a machine code problem I have. I know that you can test the keyboard and wait for an input by calling address &BB06, which will return the character typed in the A register. However, I want the computer to wait for a number-only input, preferably four digits long. Can you help?

Michael Heyes
Nelson
Lancashire

Basically, you'll need to test the result of the key press to make sure it's in range after the machine code call. The ASCII code for "0" is 48 decimal, so this must first be subtracted – any input with a code less then 48 will produce a carry. Any numbers will now be in the range of 0-9, so anything with a code of 10 or more won't be a number. Comparing the result with ten will therefore produce a carry if the number is within the limit.

This routine will read four numbers from the keyboard and store them following the RESULT label.

```
RESULT  DB    0,0,0,0

DIGITS  LD    HL,RESULT
        LD    B,4         ;read 4 numbers
LOOP    CALL  GETNUM      ;get the number
        LD    (HL),A      ;store it
        INC   HL
        DJNZ  LOOP        ;All done?
        RET

GETNUM  CALL  &BB06       ;Read keyboard
        SUB   48          ;Numbers start at 48
        JR    C,GETNUM    ;less than zero?
        CP    10
        JR    NC,GETNUM   ;greater than 9
        RET
```

●Art for art's sake

I have been searching frantically to find out how I can draw pictures on my computer, an Amstrad CPC464. I don't know if I'll need a disk drive, certain tapes or what. Could you please tell what I'll need? I'd like to get good enough to draw pictures and send them in to *The Gallery*.

James Goldsmith
London

You need an art package, James. The CRL Image System *and* Electric Studio Light Pen *are both available on tape, and either one should fill your needs admirably.*

●Out of control

I recently purchased a second-hand disk drive for my CPC 464. There was no control program (CP/M) with it. Could you please tell me how to obtain this disk as the disk drive is useless without it.

Robert Giblin
Galway, Ireland

You can get a replacement CP/M 2.2 disk – the version normally supplied with the DD-1 interface – for £18.89 from C.P.C. Ltd, 194-200 North Road, Preston, Lancashire, PR1 1YP ☎ 0772 555034.

The disk drive, however, is perfectly useable without CP/M. The only program you're likely to use very often is the disk formating program, and much better ones exist, such as Nirvana *from* Goldmark, 51 Hatfield Road, Herts ☎ 0707 271529.



● Who needs CP/M?

●Tape Jape

I have a problem with my CPC464. When I save a program to tape and then try to load it in again, it doesn't work. Most of my old stuff works fine, and I have cleaned the heads loads of times. Is there anything else I can do?

Stuart Pork
Blackburn
Lancs

As it seems the machine loads in your old stuff well enough, it is not inconceivable that it's saving only that is at fault. Get the cassette mechanism checked over by your local radio repair shop, they should be able to fix the fault.



● Broken computer? Leave it to the experts.

●Column knowledge

Firstly I would like to thank you for publishing such an interesting item on *Tasword* by Tom Osmond. However, there is one comment I would like to make, which I hope would be useful to other readers.

Tom states that it is not possible to print out two columns of text with *Tasword*, and that Tasman themselves say that it is impossible. I have, however, discovered a way to do this.



Select the place for your left hand column margins, say 1 and 38, and continue to write the document in the usual way, but make sure that you have Right Justification on.

Having finished column one, reset your margins, for example between 43 and 80, and continue to type the document. When you have finished, the next step is to reform the margins to cover the two column extremes, the left hand set to one, and the right hand set to 80. Remove Justification (Control F) and save in the normal way. All that remains to do is print out your two-column masterpeice.

B S Dennis
Berrydale
Northampton

Thanks for that Mr Dennis. You will shortly be recieving a two-column document from us – the columns being pounds and pence!

●But No, seriously...

You asked for useful one liners – well here are a couple that I find very useful.

```
10 Memory
&1FFF:INPUT"Filename:",a$:LOAD
a$:st=VAL("&"+HEX$(PEEK(&A76B),2)+HE
X$(PEEK(&A76A),2)):PRINT"Start loca-
tion: &";HEX$(st,4):PRINT"Length:
&";HEX$(PEEK(&A76E),2);HEX$(PEEK(&A7
6D),2):MEMORY st-1
```

This loads a binary file, and tell you where it sits in memory. It sets HIMEM to the memory location immediately below the start of the program.

```
10 INPUT"Filename:",a$:OPENIN
a$:WHILE NOT EOF:LINE
INPUT#9,b$:PRINT b$:CALL
&BB18:WEND:CLOSEIN
```

This does the same as the CP/M TYPE command. It allows you to view the contents of an ASCII file. Press a key to see the next line.

Rowland Jack
Fen Ditton
Cambridge

Here is an AA one liner: I say, My CPC has no nose. Really? How does it smell? Terrible!

●I can't face it

I have been having problems saving some of my tape games onto disk with Multiface II.

The Games in question are *Shinobi* and *Batman – The Movie*. The games load fine from tape, but simply won't save onto a disk properly.

After pressing the red button on Multiface, and then 'D' for disk on the menu, the disk drive jams and makes a strange grinding noise. When I eject the disk and try again the disk seems to save OK, but the games crash when I try to load them.

There is nothing wrong with the Multiface or the disk drive, as all other games save and load with no problems. What am I doing wrong?

James Howe
Sheffield

Both the games that you mention are multi-loaders, i.e. they load information from the tape as they go along. Therefore, you couldn't save the whole game to disk, only a section of it. However, it should not normally crash upon loading, as it does in your case.

It sounds to me that the games' built-in protection system – designed to combat illegal copying – detects the presence of the Multiface and resets the machine to stop the copies being played. Although you only want to back the games onto disk for faster loading, I'm afraid that the protection means you're going to have to use tape every time.

●Silicon Disk

I have a friend who owns a Spectrum (boo!). He has shown me something called the 'M' drive, and with this he can store BASIC programs and data without the use of extra software, and then call them back later. I assume this is some kind of silicon disk. If so, why hasn't the CPC got one?

B Peters
Sheffield

You assume correctly, the Spectrum does have a built in RAM drive – it uses some of the extra memory available to store information by bank-switching the extra memory and copying data to and from it. Rest assured that this is the only decent feature that the Speccy has, as it suffers from a horrendously slow BASIC and chronic graphics.

The Amstrad doesn't have a RAM drive built-in, but it is not impossible to implement one through machine code.

●An Apple a day

I want to transfer data from an Apple Mac to my Amstrad CPC6128. Only text is involved, and it is not particularly important that the format is preserved.

Is there any way of doing this? I use *Protext* as my basic format for text.

Eamann 'O Ceallaigh
Belfast

You've come to the right people, Eamann. We transfer data between CPCs and Macs daily.

You will need an RS232 interface and transfer software for the CPC – such as Comstar. *The Mac doesn't have a 'standard' RS232 interface, and is furnished instead with the even more non-standard RS432. Basically, the two standards are the same, but have different style plugs, so you will need to wire up a cable to connect both together. We use the shareware program* Red Ryder *on the Mac end of our set-up. Configure both to the 9,600 baud rate, eight data bits, one stop bit and no parity. Use XMODEM protocols to transmit the data, and Mac's your uncle!*

●Getting Serious

Last June I bought an Amstrad CPC464, and up until recently have used it just for games. However, I am beginning to realise the CPC's full potential, and have just bought a word processor program.



● Light Pen – an ideal drawing tool.

Now I would like to add an art package to add to my collection, and would appreciate some advice as to which one I should go for. Are the *Electric Studio Light Pen* and *Pandora* good programs? I do not need a really advanced package as I am a beginner, but I'm willing to pay around £20 for my needs. Will I need a mouse, is it really necessary?

Neil Sainsbury
Sunbury-on-Thames
Middlesex

Both Light Pen *and* Pandora *are good programs, but* Pandora *isn't any good for drawing pictures – it's a games designer, not an art package!*

You don't strictly need a mouse, although they are very useful for artistic endevours. Advanced Art Studio *and* AMX Mouse *are good art packages that can use mice. Otherwise, the* Electric Studio Light Pen *comes with a light pen as standard, which is an ideal tool for drawing on screen.*

●Reformed character

I have just purchased my first printer, an Amstard DMP 3160, to go with my CPC464. Things started off just fine, until I adjusted the DIP switches to print the IBM Character set 2. Then, when I instructed the printer to print CHR$(219), it didn't produce the right character.

According to the manual it is supposed to print a square, but instead it printed a bracket, which is supposedly the CHR$(91) symbol. I got the printer to operate its self-test facility, which printed out the correct characters, but when I did a for-next loop to print the character set it prints the numbers and letters, but not the symbols.

Please could you tell me why this happens, and how to overcome it if possible?



● When it comes to printing, the CPC is a bit short of a full byte.

Dave Cane
Oadby
Leicester

Although the CPC comes complete with the industry-standard Centronics printer interface built in, it only uses seven bits to send data – the eighth bit is not used. This means that only characters in the range of 0-127 can be sent to the printer.

The net effect is that any character code above this limit will have 128 subtracted from it. In your example, where you attempted to send the code 219 to the printer, subtract 128 from that, and the result is – you've guessed it – 91.

KDS can supply you with an 8-bit printer port that slots into the back of the CPC's 7-bit port. Give KDS a call on 04853 2076.

●Mice and easy

£10

If you have an AMX mouse and would like to use it in your own programs, then I have discovered a few bits of information that may be of interest.

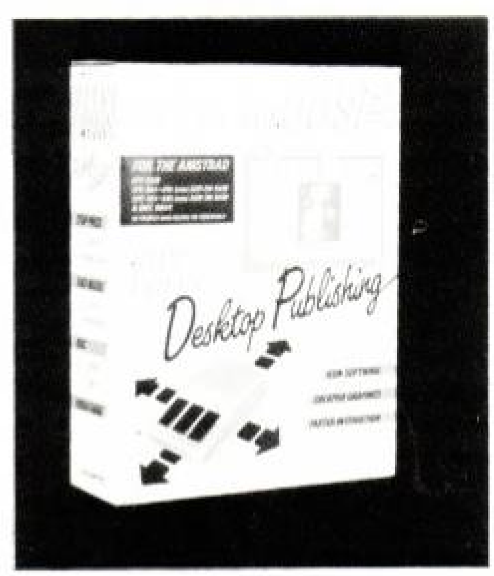
The movement of the mouse returns values to key numbers 72-75 – the same numbers as joystick one. The fire buttons concur with fire one and fire two. The third button *seems* to do nothing – but in fact it does. It is key number 78, which, unless re-defined, does not print to the screen. It is easy enough to read the ports by using the KEY command.

The third button also returns 64 to the JOY(0) function. If you want all three buttons to be of equal value, then use IF JOY(0)>15.

B Bristow
Hastings

Thanks for those snippets Mr Bristow. I'm sure that your tips will be of great interest to other AMX users.

So much so, that we are awarding you with a crisp tenner - just the thing to buy yourself a mouse mat and one of those furry little mouse covers!



● The AMX Mouse – use it in your own programs.

Free for all!



● Trenton Webb, freeloader extraordinaire, has a nice crisp tenner to give away (*first time for everything - ed*). All you've got to do is exercise your powers of observations - see the box opposite for details

You can't get something for nothing, right? Wrong! JERRY GLENWRIGHT introduces the world of Public Domain software in the first of a regular series...

The Amstrad CPC has been on the market for several years. There's a wealth of good software available and most owners of the machine are happy with the amount of software still rolling off the electronic presses every month. But software is expensive. Games cost between £1.99 and £14.99 and serious software can be anything from £15 upwards.

Bearing these prices in mind, how would you like to get your hands on a large amount of software, covering everything from games to utilities to full-blown serious business software, all widely available and all *free*? That's right! If you know where to look there's a veritable Aladdin's cave of good software all free, gratis and for nothing. This software is known as PD or Public Domain software. And the principle of Public Domain software is that it is completely free - anyone can make any number of copies of the software perfectly legally!

But just how did this happy state come about?

History lesson

Micro computers, although popularised via 'Uncle' Clive Sinclair in the UK, originally started as garage projects in America in the late 1970s. Electronics tinkerers were building small computers using the newly-available integrated central processing units from Zilog and Intel and Motorola. A whole network of these talented home micro pioneers sprang up across the the USA. Schools and Colleges joined in too and soon there were thousands of people writing hundreds of thousands of programs to support this home brew silicon.

With the advent of Bill Gates and his CP/M operating system, one especially intended for use with 8 bit machines, the way was clear for users to exchange software which would work with a variety of different computers all running CP/M. But the descisive event in the history of PD was when the powers-that-be decided that all software written in Universities, colleges and schools throughout the United States was declared to be in the 'public domain'. That is, although the author retained copyright, anyone could make a copy and distribute it as long as the software remained in its original form and those distributing it did not make a profit.

The idea became an instant success. Libraries sprang up to store and distribute the new PD software and everyone wanted it. Comms enthusiasts exchanged vast quantities of program code via the telephone network (local calls are free in the USA) and everyone had PD programs of some description.

Some users were so pleased with their 'free' software, they made spontaneous donations to the author, and a new form of PD took off – *Shareware*.

Shareware is not commercial software, yet it's not quite public domain, either. Anyone can make a copy of a sharware program and give it to their friends or colleagues, but if the recipient likes the program and wishes to keep and use it they must make a small contribution to the author - usually about $10. To encourage users of the software to make contributions, authors offer incentives in the form of program updates, extra documentation, hardcopy manuals etc. In this way, sharware has become a thriving way for authors who don't want to tout their work aorund the commercial software houses to receive virtually free distribution.

Home base

However, sharware has never really caught on in the UK. Shareware distributors make loud claims about how British computer enthusiasts are beginning to send their donations, but the concept remains in its infancy. There is, however, an enormous quantity of public domain software, and thanks to Mr Sugar's descision to market a version of CP/M for use with our favourite machine, it's all available to CPC users.

An Amstrad CPC running CP/M has access

to literally hundreds of thousands of programs – some excellent, some good, some not so good – written both here and in the USA over the last decade. Software of every size, description and purpose, and all for the price of the disk and copying.

So just what do you need in order to gain access to all this software? Well all you really need is a CPC. Although probably 99% ofthe public domain libraries distribute their wares on disk, there are those willing to provide PD software on cassette. If you do receive PD on cassette it will be restricted to BASIC programs – you need a disk drive and CP/M to access CP/M software, but many BASIC programs are very good and there are a lot of fun games, programming utilities and even some serious business-type software available. The ideal however, is to have a disk drive. Owners of the CPC664 will have a disk drive and a copy of CP/M 2.2; those with 6128s have CP/M Plus, a slightly better version.

The difference between these two versions lies in the amount of memory available for software when CP/M is running. This memory is known as TPA or Transient Program Area by CP/M. CP/M Plus offers far more free RAM to the user than 2.2, but either will enable you to make use of PD.

Many prospective users of public domain software are put off by the lack of documentation when they receive programs. Well, PD does indeed hardly ever come with printed documentation, but there is always a text file on disk detailing the operation of the programs, a file that you can 'Type' and read on screen, or dump to your printer.

WHERE CAN I GET IT?

Good PD libraries abound – you need only check the pages of *Amstrad Action*, for example. In the meantime, here are just a couple of addresses to be going on with:

- Wacci UK, 9 South Close, Twickenham TW2 5JE. Telephone 01 898 1090. Wacci has an enormous collection of PD featuring every conceivable type of program. Disks stuffed with code cost a reasonable £6.50 each, or you can elect to buy single programs at 4p per K. A catalogue is available from the above address.
- Robot PD Library, 2 Trent Road, Oakham, Rutland LE15 6HF. Probably the only cassette-based PD library in existence. A large quantity of good games and other BASIC programs. To receive PD, send a blank cassette, postage and 40p. Your cassette will be returned bulging with code. A catalogue is available from the above address.



● WACCI's regular fanzine. The company is a prime source of PD software for the CPC.

But what can I get?

Fine, thinks you. You've read the feature, know all about public domain software, like the idea and now you want some of your own. So just what's available – and more importantly, where can you get it? First, the sort of program you can expect:

● VDE Word Processor

Word processing probably accounts for the largest proportion of time spent with a micro. Almost everyone from the serious businessperson to the hardened games freak writes letters at one time or another. Using your CPC simplifies the process and ensures you have a copy of the letter into the bargain.

You've probably heard of *WordStar* for the IBM-PC and its compatibles – the most popular word processor in the western hemisphere. Well now you too can have a 'version' of *WordStar* right there on your CPC.

VDE is a *WordStar* clone that puts the power of *WordStar* at your fingers, yet is entirely free. The program uses all of the *WordStar* keyboard shortcuts yet is much faster than that financially remote word processor (£50 on the CPC!). There's a spell checker too for those of you who, like me, have trouble with any word of more than two syllables...

The latest version is *VDE 2.66* and is well worth a look for anyone about to write anything larger than a betting slip.

● Scrivener

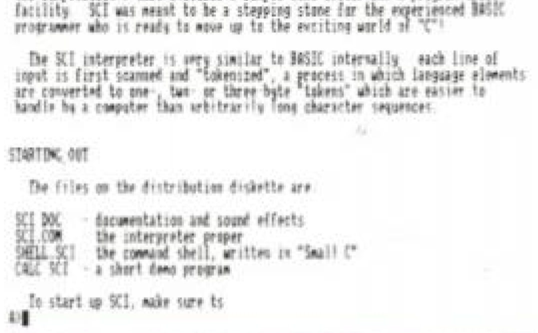
Stamp collectors, trainspotters, record and cassette hoarders – all need to catalogue their burgeoning collections in order to locate desired objects quickly. What better way than to use your CPC to keep a powerful database giving you access to all parts of your collection in the blink of an eye?

Originally commissioned by Amstrad, *Scrivener* is a powerful spreadsheet-cum relational database which has been released into the public domain. Amstrad simply couldn't conceive a suitable marketing pitch, and so now the power of *Scrivener* is available to you free.

A breathtakingly powerful software solution that's a must for any collection.

● Small C Interpreter

C is probably the most popular programming language of the decade. No computer software collection is complete without a version. Schools and colleges teach it and software houses use it to write many serious applications. C has gained popularity because it is easy to learn (although you can spend a lifetime mastering it), portable – write a program on your CPC and transfer it to any other computer running the language – and it lets you get down to the CPC's nitty gritty, in amidst the operating system, where you can perform all kinds of wierd and wonderful things.



```
  SCI is a "C" language interpreter loosely based on the language subset
described in James Hendrix' "Small C" compiler (see the section
"DIFFERENCES FROM SMALL C", below). It is a fully interactive interpreter
(no compilation!) that includes a simple line editor and a program trace
facility. SCI was meant to be a stepping stone for the experienced BASIC
programmer who is ready to move up to the exciting world of "C"!

  The SCI interpreter is very similar to BASIC internally: each line of
input is first scanned and "tokenized", a process in which language elements
are converted to one-, two- or three-byte "tokens" which are easier to
handle by a computer than arbitrarily long character sequences.

STARTING OUT

  The files on the distribution diskette are:

SCI.DOC   - documentation and sound effects
SCI.COM   - the interpreter proper
SHELL.SCI - the command shell, written in "Small C"
CALC.SCI  - a short demo program

  To start up SCI, make sure ts
A>
```

● *Small C Interpreter*:popular and powerful language.



```
main()
{
  int from, to;

  top:15000;
  program[0] : 90;  # This is an "End of program" token - required
  size=1;

  # print sign-on message
  printf( "%s\nShell V1.1, 23 OCT 1985\n", sys(0) );

  while(1)
  {
    puts(") ");
    if(gets(line))
    {
      if (!strncmp(line,"edit",4))
        size : sys(atoi(line+5),program,15); # invoke the editor
      else if (!strncmp(line,"save ",5))
        sys(line+5,program,21);             # save the program buffer
      else if (!strncmp(line,"load ",5))
        size : sys(line+5,program,20);      # load the program buffer
      else if (!strncmp(line,"list",4))
      {
```

● *SCI* produces interpreted code – quick for learners.

Several versions are available in the public domain but one of the best is the *Small C Interpreter*. Rather than using a conventional compiler program which takes your C source code statements and changes them into a code the CPC can understand directly, the program has an interpreter which behaves in a similar manner to the CPC's BASIC interpreter. That is, it enables you to write source code state-

FREE TENNER!

Well, yes, just the one else! And even that crispy little item has got to go to the right home. Basically, we are going to send it to the first person to SPOT THE DELIBERATE MISTAKE.

All we're going to tell you is that it's somewhere on these three pages and it's pretty blooming obvious if you've got your wits about you.

Of course, if nobody spots it then it goes towards the Editors Benevolent Fund in the pub next door...

ments and have them performed by the machine directly without having to wait for a compilation.

Although interpreted code is not as fast as the output from a compiler, using the former is a much quicker solution when learning a language than the latter. You can type in a couple of commands and 'run' them, seeing their effect immediately. No more do you have to put up with the write, compile, run, crash, re-write, re-compile sequence. Watch, as your programs jump through hoops before your very eyes.

Small C Interpreter comes with everything you need to write and run C programs. Although, as its name implies, *Small C* is a slightly cut down version of the language, it is nontheless an excellent learning tool. Good documentation on disk is also included. Available from most good libraries.

● Disk Utility

Disk Utility describes it self as a 'disk diddler' – a program that enables you to modify and examine any part of a CP/M floppy disk. Written in the early '80s, the program has



● *Disk Utility*: Comprehensive disk editing ability.

gained enormous popularity amonst CP/M disk diddling devotees over the years. And because it's in the public domain and entirely free, you can join in the fun too.

Recover crashed disks, rebuild directory structures, modify the CP/M system run-time parameters, back up protected sofware and more. For programmers, techno tinkerers and the plain curious, *Disk Utility* is a must.



● *DU* can let you recover data from damaged disks.

● Disk Menagerie

More disk utilities in a similar vein to *Disk Utility*. This one comes with a nice menu-driven user interface, so even complete novices can destroy all their disks without recourse to



● *Disk Menagerie*: another excellent disk utility.

the usual heavy textbooks...

The program enables users to edit directories, sectors and tracks, map the disk of particular files, search the disk for ASCII text strings or hex sequences (useful for discovering games cheats!), receive header information, recover erased files, perform disk skewing to speed up loads and saves, and a whole hots of other goodies too numerous to mention.

Altogether, an excellent and comprehensive disk tinkering program.

● Nomopoly

Yes, you guessed, this is a version of everyone's favourite board game – and what a good version it is too! You can play against your Amstrad CPC or another human, there's a well-drawn, full screen display of the board, and lots of excitement as you race to buy up property, build houses and hotels and get the CPC to wind up at the soup kitchen, a broken and bankrupt computer.

Nomopoly features on-screen dice, scoring, players names along with current assets etc, and novel little cheats such as being able to nudge the dice if you don't like the outcome after rolling them.

A fun game, which is well implemented and a treat to play. Available at most good public domain libraries.

How much?

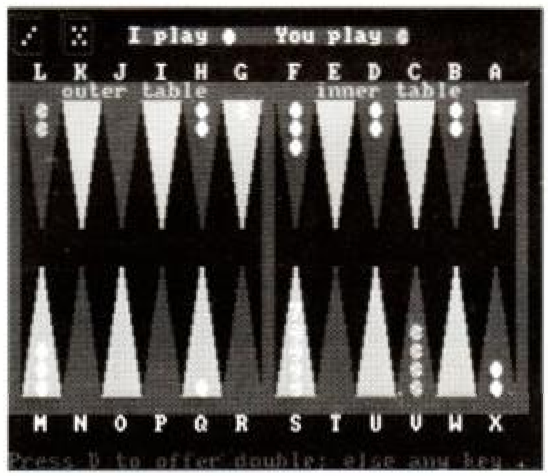
Wait a minute. If public domain software is supposed to be free, how come public domain libraries charge you for it?

Actually, they don't. The principle is that although you must not charge any money for the software itself, you are allowed to charge a reasonable amount for the job of duplicating it, printing catalogues, sending it out etc. It is possible to run a public domain library as a paying concern on the basis of providing a service rather than charging for the software.

● Backgammon

Not as popular perhaps as *Monopoly*, but still an excellent game. This version includes a full-screen representation of the board. Computer responses are fast, even when it's forced to calculate doubles, blots etc. You can play against your computer, a human opponent or watch the CPC play against itself. And if you get called away, there's a Save Game feature which enables you to resume play another day.

Great fun, thrilling, and the Amstrad plays a strong and convincing game.



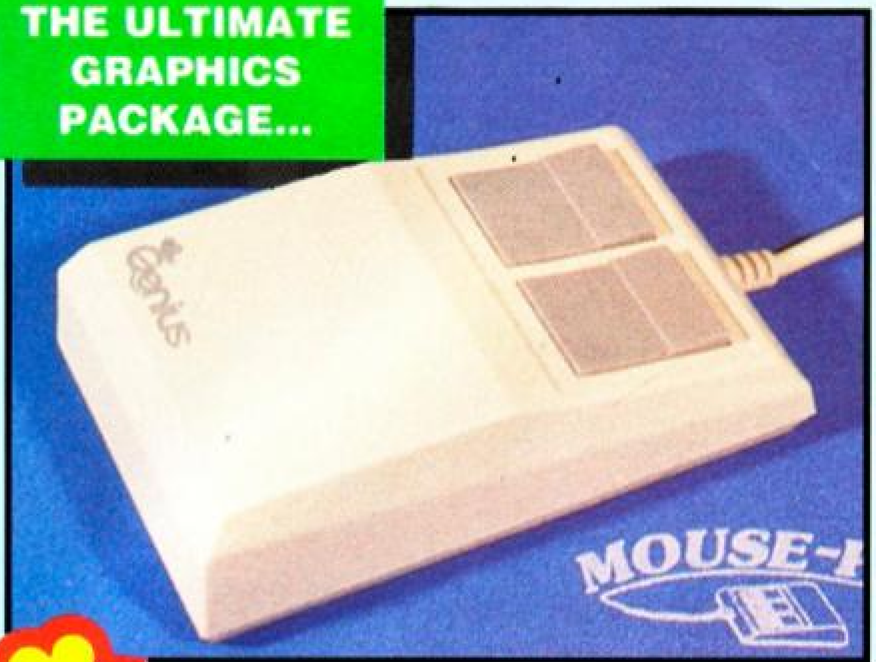
● *Backgammon*, CPC-style.



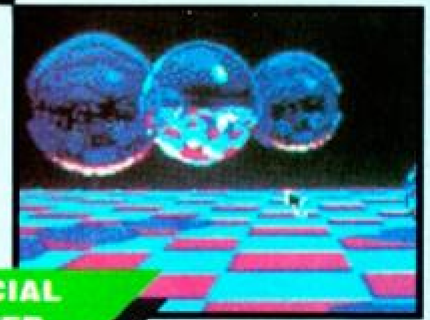
● *Nomopoly*: Sound familiar?

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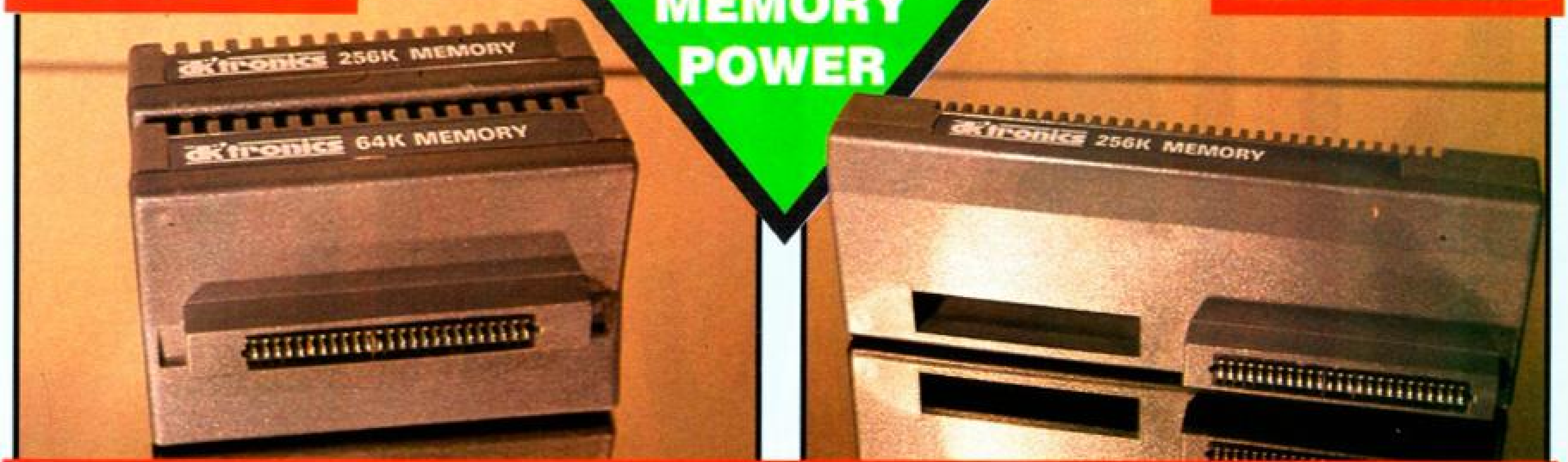
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Naked Video



CONRAD BESSANT probes deeper into the murky underworld of the CRTC in Part 2 of his video effect series...

The Cathode Ray Tube Controller (CRTC), is the chip which, in conjunction with the video gate array, generates the video signals required by the monitor to build up an image on the screen. The CRTC can be thought of as an interface between the computer and the monitor.

Just as there is, for example, a keyboard interface inside the computer, there must also be one for the monitor. The CRTC is possibly the most versatile interface inside the CPC, which also means that it is, unfortunately, one of the most complicated. However, we will not be going any further into the complexities of the chip than we have to in order to produce video effects.

The CRTC examines the screen memory and generates a video signal whose form is determined by the contents of the CRTC's 18 registers. The video gate array then adds colour information to this after consulting the colour pallete.

Once the monitor has received the signal it can build up the display. This is done by scanning the screen with an electron beam as shown in Figure 1. The beam starts at the top left corner of the screen and scans horizontally to the right hand side, building up the first line of the display. The beam is then switched off and moved to the left hand end of the line below, which it scans horizontally as it did the first line.

This process repeats until the right hand end of the bottom line is reached. When this occurs the beam is switched off and moved back to the top left corner of the screen. This 'homing' action is called frame flyback, and occurs every fiftieth of a second.

Frame flyback is the only relatively long period during which the display is not being written to by the CRTC, so if possible actions on the screen should be performed during this period to avoid unsightly effects. Most software activities, such as the BASIC 'INK' command are automatically synchronised with frame flyback, i.e. the ink is changed while the beam is travelling back to the top left corner.

If the CRTC is to be addressed in assembly language, the register number and CRTC data need to be substituted into the routine below:

```
LD A, CRTC register no. }
LD BC, #BC00            } Select reg.
OUT (C),A               }

LD A, CRTC data         }
LD BC, #BD00            } Send data
OUT (C),A               }
```

However, when addressing the hardware directly this is not the case, so we need to synchronise it ourselves using the firmware routine MC WAIT FLYBACK. Calling this routine (at &BD19) causes the computer to pause until the CRTC reports that frame flyback has begun. Scrolling is impossible to perform smoothly without this routine.

The table in Figure 2 shows the CRTC's 18 registers, while Figure 3 shows the purpose of the most useful ones. Each register controls a different characteristic of the screen format, and it is by sending values to these registers that effects are performed.

In general we will be discussing details of particular registers when we need to use them, but if you can't wait to find out what each register does then you can use the information given in the table to experiment. Note that 'scrambling', for the purpose of the table, simply means distorting the display. Apparently grossly distorting the display using the CRTC can cause permanent damage to the monitor (although I have never encountered this on the CPC) so be careful, particulary with registers 0, 3, 4 and 5.

The recovery range is the range of values which can be sent to the CRTC without the computer crashing. Where these are not specified, values from 0 to 255 are acceptable.

As the CRTC is an interface device, the only way we can write to it is by using hardware input and output commands. In BASIC these are:

Figure 2 - TABLE OF CTRC REGISTERS

No.	Description	Usual Value	Recovery Range	Use In Special Effects	Read/Write
0	Horizontal Total	63	46-255	Wobbling	W
1	Horizontal Displayed	40		Clearing the screen	W
2	Horizontal Sync. Position	46	0-63	Wobbling	W
3	Sync. Widths	142	129-143	Scrambling	W
4	Vertical Total	38		Wobbling	W
5	Vertical Total Adjust	0		Wobbling	W
6	Vertical Displayed	25		Clearing the screen	W
7	Vertical Sync. Position	30		Wobbling	W
8	Interlace And Skew	0		Shimmering, etc. etc.	W
9	Maximum Raster Address	7		Scrambling	W
10	Cursor Start Raster	-		None	W
11	Cursor End Raster	-		None	W
12	Start Address (High)	- (&C0)		Scrolling	RW
13	Start Address (Low)	- (&00)		Scrolling	RW
14	Cursor (high)	-		None	RW
15	Cursor (low)	-		None	RW
16	Light Pen (high)	-		None	R
17	Light Pen (low)	-		None	R

(- indicates these are variable, numbers in brackets are default)

`OUT <address>,<data>` to output data, and `INP (<address>)` to input data

To send a value to a CRTC register we must firstly select the register by writing the required register number to the CRTC register select channel, and then send the data via the CRTC data channel. The address of the CRTC register select channel is &BCxx, and the address of the CRTC data channel is &BDxx (an x means that this can be any digit), so to send the value d to register r of the CRTC in BASIC, we use:

```
OUT &BC00,r 'Select register r OUT
&BD00,d 'Send d to this register
```

For example, to send the value 62 to register 0 (the horizontal total register) we would use:

```
OUT &BC00,0 OUT &BD00,62
```

To put the display back to normal we must send the register its normal value of 63 – so type:

```
OUT &BC00,0 OUT &BD00,63
```

'Wobbling' the screen

During the course of a game it is quite possible that an explosion or crash will occur. When this happens, wobbling the screen (i.e. rapidly changing the position of the display relative to the screen origin) can make the event more pronounced. The following discusses the two registers used to wobble the screen, and explains how it is done.

● The Horizontal Sync. Position Register (R2)

This register determines where on the screen the leftmost character position is. By decreasing this, the entire screen can be shifted right, while increasing it moves the whole screen left. For example, the following shifts the screen right by four CRTC character widths (46-4 = 42):

```
OUT &BC00,2 OUT &BD00,42
```

Note that a CRTC character width is always as wide as a MODE 1 text character, i.e. a fourtieth of the width of the screen.

At first, this seems like a good register to use for sideways scrolling. However, there are several reasons why this is unsuitable – for example, it does literally move the whole display, including the border (try entering something like BORDER 16 to make the border visible).

However, this is still a very useful register for 'wobbling' the screen. By sending itr values not far either side of its usual value of 46, the screen can be made to wobble from left to right. The following program demonstrates this, it will repeat indefinitely until a key is pressed:

```
10 BORDER 15
   'Make border visible
20 WHILE INKEY$=""
30 OUT &BC00,2
   'Select register 2
40 OUT
&BD00,40+INT(RND*12)
   'Send a value of 40-52
50 WEND
60 OUT &BC00,2:OUT
&BD00,46
   'Restore screen pos.
```

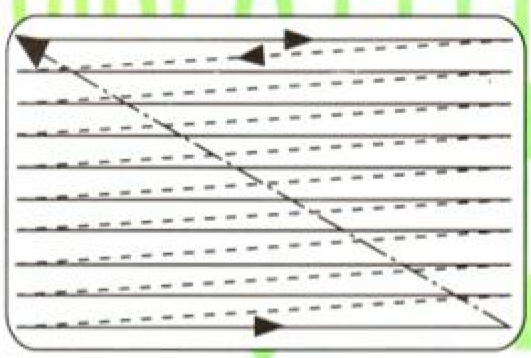


Figure 1, Scanning the display
—— = Beam visible.
—— = Beam invisible.
= = = = = Beam invisible for frame flyback.
NB. Not to scale.

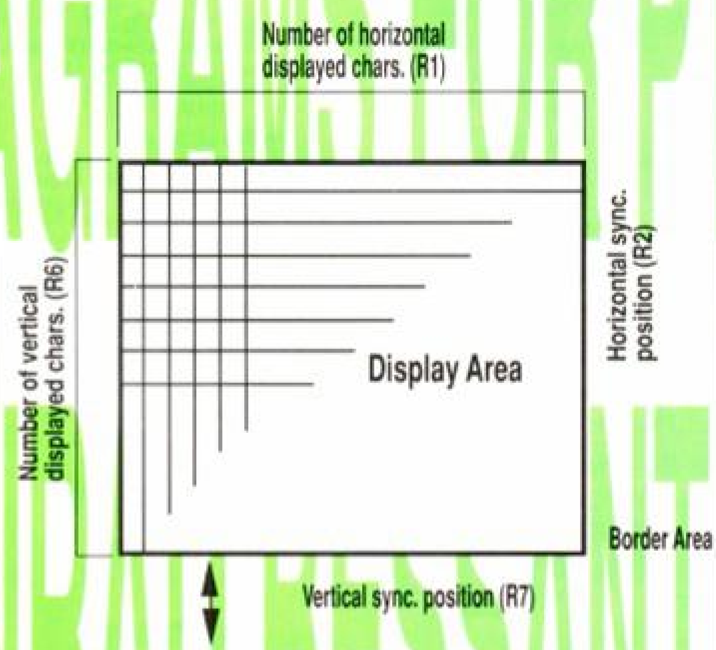


Figure 3, Some useful registers

This only wobbles the screen horizontally. To wobble it vertically, the vertical sync. position register is used.

● Vertical Sync. Position Register (R7)

This is a 7-bit register, and has a similar purpose to its horizontal counterpart, register 2. This determines the position of the display vertically on the screen. Increasing it's value causes the screen to move up, decreasing it causes it to go down.

Just as a horizontal wobble can be created using register 2, a purely vertical wobble can be created using this register. The following program is an example of this:

```
10 BORDER 15
   'Make border visible
20 WHILE INKEY$=""
30 OUT &BC00,7
   'Select register 7
40 OUT &BD00,28+INT(RND*4)
   'Send a value of 28-32
50 WEND
60 OUT &BC00,7:OUT &BD00,3
   'Restore screen pos.
```

As you can see, this is not dissimilar to the horizontal wobble program shown above. By combining these two programs the screen can be made to wobble very convincingly. The following program performs a simultaneous horizontal and vertical wobble:

```
10 WHILE INKEY$=""
20 OUT &BC00,2
30 OUT &BD00,40+INT(RND*12)
40 OUT &BC00,7
50 OUT &BD00,28+INT(RND*4)
60 WEND
70 OUT &BC00,7:OUT &BD00,30
80 OUT &BC00,2:OUT &BD00,46
```

In some cases, the ferocity of wobble may need to be altered depending on, for example, your speed when you crash, or how close you are to an explosion. This can be done in several ways, either by introducing a delay to slow it down, shortening its duration, or by decreasing the range of values which are sent to the registers.

For example, the range for the horizontal sync. position is currently 40 to 52, so the dislay moves back and forth through a fairly large displacement. However, changing line 30 to:

```
OUT &BD00,44+INT(RND*4)
```

will give a much more sedate wobble, as the range is now only 44 to 48. A similar alteration could be also be applied to the vertical range.

Next time we will be using registers 1, 2, 6 and 7 of the CRTC to produce some interesting screen clearing routines.

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Cracking the code

Machine code maestro MICHAEL GLEDHILL gets into sprite handling in part 2 of his advanced coding tutorial...

This month we'll tackle sprites – and how better than with a simple sprite display program?

```
Entry:DE = Screen address to display sprite at
      HL = Sprite location
      B  = Sprite width
      C  = Sprite height

      LD   A,B
      LD   (p1+1),a
loop1:PUSH DE
p1   :LD   B,&0
loop2:LDI
      INC  C
      DJNZ loop2
      POP  DE
      LD   A,D          ; You could replace this
      ADD  &8           ; with EX DE,HL:CALL
                        ; &BC26:EX DE,HL
      LD   D,A          ; but this way is quicker.
      JR   NC,end       ;
      LD   A,E          ;
      ADD  &50          ;
      LD   E,A          ;
      LD   A,D          ;
      ADC  &C0          ;
      LD   D,A          ;
end  :DEC  C
      JR   NZ,loop1
      RET
```

This is probably the fastest sprite routine (unless you know better) and cuts down on using the more normal loop of...

```
      LD   A,(HL)
      LD   (DE),A
      INC  HL
      INC  DE
```

...with this clever bit...

```
     LDI
      INC  C
```

...which is 6 T-states quicker. This may not seem very long, but that bit of code has to be executed (sprite length) multiplied by (sprite height) times, so ends up a quite significant saving.

The LDI instruction does the same as the four commands above it, but also increases BC – which will only affect C, as the loop never executes when C=0, so rather than using INC BC, we can safely use INC C, which is faster than INC BC.

So there you have it. What more could there be to sprites? Well, quite a lot actually. The routine above is fine for most purposes, but isn't designed for pixel accuracy. What this means is that if you used the routine for displaying sprites in a 3D game like *Head over Heels*, you wouldn't be able to see "through" the sprites to sprites behind them, as the sprite will always have a square border.

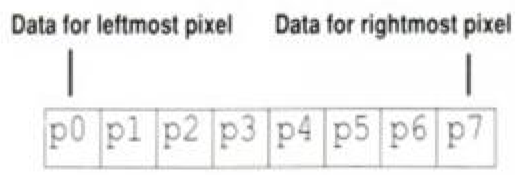
In fact, getting pixel-accurate sprites can be quite a hard business. I'll show you how to design them, but please note that if your sprites are going to appear on a blank background, there is very little need to use pixel accuracy. The routine above is perfect for your needs, and it's faster than the routines below.

To start of with, you need to understand two things. Firstly, how the AND and OR commands work, and secondly, the way pixels are stored in each mode.

Assembly books will go into more detail, but here's a quick reminder...

Fig 2.1: Mode 2 (mono)

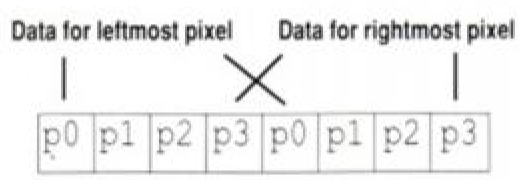
each byte store 8 pixels



Each pixel can be 'on' or 'off', hence one bit per pixel is needed.

Fig 2.2: Mode 1 (4 colours)

each byte store 4 pixels



Each pixel requires two bits to store the pen number (0 to 3). The four most significant bits store BIT 1 of this number, the four least significant bits store BIT 0.

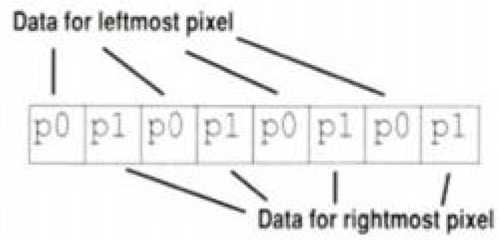
Example:

1	1	0	0	0	1	1	0

Pixel 0 = &X10 = Pen 2
Pixel 1 = &X11 = Pen 3
Pixel 2 = &X01 = Pen 1
Pixel 3 = &X00 = Pen 0

Fig 2.3: Mode 0 (16 colours)

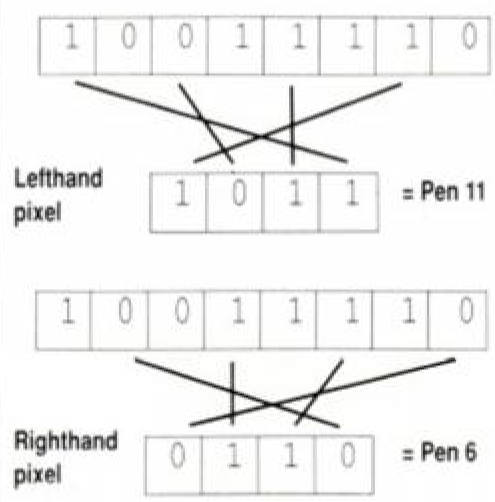
each byte store 2 pixels



Each pixel requires four bits to store the pen number (0 to 15), however the way the bits are stored may appear confusing.

L0	R0	L2	R2	L1	R1	L3	R3

Examples:



The point of using the AND command is that you need to read what's on the screen and keep some of those pixels as they are, but to blank the others which are going to be displayed in another colour. To clarify that, suppose you're in mode 1, and you want to plot the second from left pixel on the top line in pen 2. This will mean altering the address &C000.

First you need to look at what's at &C000. Let's suppose that &6D is stored there. What does that mean ?

Fig 2.4

&6D =	0	1	1	0	1	1	0	1
	p0	p1	p2	p3	p0	p1	p2	p3

Pixel 0 = &X01 = Pen 1
Pixel 1 = &X11 = Pen 3
Pixel 2 = &X10 = Pen 2
Pixel 3 = &X01 = Pen 1

So pixel1 is currently in pen 3. What next? Simply merge the code to set pixel1 in pen 2? Let's use OR to merge in the code.

Fig 2.5

Initial contents of &C000	&6D
OR pixel code	&40
equals	&6D

0 1 1 0 1 1 0 1

Pixel 1 is still in pen 1 1 = 3

Only the bits of the pixel1 code need to be reset. To reset the code, we need to use AND together with &X10111011, which will keep all other bits as they are. Then we need to use OR to merge in the pen 2 at pixel1 code, &X01000000 – The result being:

```
LD   A,(&C000)
AND  &BB
OR   &40
LD   (&C000),A
RET
```

Now I'll leave you to work out why the following listing will display a sprite in MODE 1 and print a sprite as normal, but will allow you to see the background through the sprite, where the sprite has pixels in pen 0.

```
Entry : DE = Screen address to put sprite
        HL = Sprite location
        B  = Sprite width
        C  = Sprite height

      LD   A,B
      LD   (pl+1),A
loopl:PUSH HL
pl   :LD   B,&0
loop2:PUSH BC
      LD   A,(DE)     ; B stores what's on the
      LD   B,A        ; screen
      LD   C,(HL)     ; C stores the byte of sprite
                        data
      LD   A,C
      AND  &88        ; Is pixel0 used ?
      JR   Z,jumpl    ; If not, check pixell
      LD   A,B        ; Pixel0 is used, so reset
                        the
      AND  &77        ;  pixel0 that's currently on
      LD   B,A        ;  the screen
jumpl:LD   A,C
      AND  &44        ; Is pixell used ?
      JR   Z,jump2
      LD   A,B
      AND  &BB
      LD   B,A
jump2:LD   A,C
      AND  &22
      JR   Z,jump3
      LD   A,B
      AND  &DD
      LD   B,A
jump3:LD   A,C
      AND  &11
      JR   Z,jump4
      LD   A,B
      AND  &EE
      LD   B,A
jump4:LD   A,B        ; Merge sprite data byte with
                        screen
      OR   C
      LD   (DE),A     ; and display it on the
                        screen
      INC  HL
      INC  DE
      POP  BC
      DJNZ loop2
      POP  DE
      LD   A,D        ;
      ADD  &8         ;
      LD   D,A        ;
      JR   NC,end     ;
      LD   A,E        ;    Step down a line
      ADD  &50        ;
      LD   E,A        ;
      LD   A,D        ;
      ADC  &C0        ;
      LD   D,A        ;
end  :DEC  C
      JR   NZ,loopl
      RET
```

To make the routine MODE 2 compatible, put the following code in between the PUSH BC and POP BC commands.

```
      LD   A,(HL)
      CPL
      LD   C,A
      LD   A,(DE)
      AND  C
      OR   (HL)
      LD   (DE),A
```

And for MODE 0:

```
      LD   B,(DE)
      LD   C,(HL)
      LD   A,C
      AND  &AA
      JR   Z,skipl
      LD   A,B
      AND  &55
      LD   B,A
skipl:LD   A,C
      AND  &55
      JR   Z,skip2
      LD   A,B
      AND  &AA
      LD   B,A
skip2:LD   A,B
      OR   C
      LD   (DE),A
```

Next time we'll go over machine code calculations and start a new regular section featuring useful routines for your toolbox!

I'll also soon be tackling the daunting task of explaining how to write a scrolling routine. So write in with details of your favourite scrolling tips. A juicy £25 cheque awaits...

READERS/WRITE

Colin Taylor is the first ever winner of the legendary £25 note! He has written in with the following speeding-up tips using the firmware:

1. Don't bother using the normal print routine, &BB5A. Basically, what this does is PUSHes AF,BC,DE,HL then CALLs the &BB5D routine and POPs AF,BC,DE and HL. Usually, you'll only need HL and/or DE PUSHed, so you can save time by having a routine like the following to print a string:

```
print:LD   A,(HL)
      OR   A
      RET  Z
      PUSH HL
      CALL &BB5D
      POP  HL
      INC  HL
      JR   print
```

This would be executed using a routine like:

```
      LD   HL,string
      CALL print
      RET
string:DB  "Amstrad Action is super-cool !",0
```

2. Many people think that to store a background which a sprite is to be printed on needs a separate routine to the actual sprite display program. The following routine will SWAP the bytes on the screen with the sprite data bytes. It will display a sprite on the screen when called, and will redisplay the background when recalled.

The only snag is that when the sprite is on the screen, that's the only place the sprite data is stored – clear the screen and the sprite's gone; corrupt the screen where the sprite is and the sprite's permenantly corrupted. The routine can be very useful when used properly, though.

```
      LD   HL,&C000   ; Put the screen address
                        in here !
      LD   DE,&4000   ; Put the sprite
                        location here !
      LD   C,ypos     ; Put the sprite height
                        in here !
yloop:PUSH HL
      LD   B,xpos     ; Put the sprite length
                        in here !
xloop:LD   A,(DE)
      DB   &DD,&67    ; This is the code for
                        LD XH,A
      LD   A,(HL)
      LD   (DE),A
      DB   &DD,&7C    ; This is the code for
                        LD A,XH
      LD   (HL),A
      INC  HL
      INC  DE
      DJNZ xloop
      POP  HL
      CALL &BC26
      DEC  C
      JR   NZ,yloop
      RET
```

Very good, Colin. If anyone out there is confused about the XH instructions mentioned in part two, take a look in the *Hackers Only* section in *AA*41. Your assembler *won't* understand the XH commands, but will happily execute the codes.

The first ever legendary twenty five pound note will be crawling its way to Colin when we've got a free moment. (It's been hell in the *AA* offices since the coffee machine broke down.) In the meantime, get your contributions flooding in. Who knows – if the ed gets to know your name, you could end up writing the follow up to this series! *(Or its replacement – ed.)*

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ACTION TEST

A whole host of gaming goodies to banish those post-Christmas blues



● From *Ghostbustin'* to gangbusting, as another film licence takes the top slot. What's the result, a bloodbath or a brainbasher? *The Untouchables* have arrived and are looking mean, but can they stop Scarface and Co. The *AA* jury weighs up the evidence and gives its verdict on page 46



● The 'wheel' thing, or just a pale imitation of the arcade? *AA* puts Domark's *Hard Drivin'* through the hoop on page 44



● The Golden Bear tees off his in *Jack Nicklaus Golf.* Is it a bogey or a birdie? Find out on page 60



● Rainbow Arts is having a ball with *Rock 'n' Roll.* Music to your ears? Tune to page 56

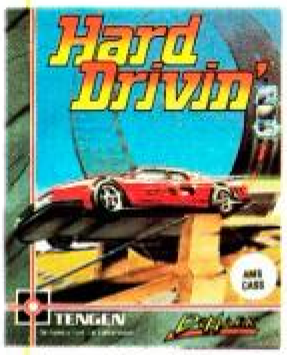


● *Pro Tennis Tour* has arrived on the CPC. *AA* calls the shots and serves up its judgement on page 49

Also reviewed

HARD DRIVIN'

Domark ● £9.99 cass, £14.99 disk joystick/keys



Take the chase from *The French Connection*, the stunts from a *Bond* movie and a little speed from Formula One, and what have you got? Some real *Hard Drivin'*. Domark's epic car racing conversion is here at last, and it's a game for losers – lunch-losers! You'll be shaken, rattled and rolled on a journey where all that matters is the speed on your clock.



● Bridge-jumping seen in instant replay.

Two tracks challenge you. Not ordinary tracks, but tortuous, twisting strips of tarmac leading you on a charge that defies both physics and logic. One's a speed track full of hidden surprises, the other a stunt course that relies on brutality not subtlety to intimidate drivers.

The aim of the game is to get around either track within a set time limit, the prize for success being a show-down with the computer's own motor – the Phantom Photon. Win, and you become the ghostly champion. Fail, and your joystick will never speak to you again. This doesn't mean you see the 'Photon' alone during the game. Littering the track in the best M25 tradition are other drivers, who love to go head to head and bumper to bumper if you happen to be in the wrong place at the right time.

The world of *Hard Drivin'* is seen through grey vector graphics' eyes. A monochrome *Freescape*-style world with one big plus – speed! Mph is no mere number set on a dial, but accurately reflected by the pace at which incidents turn into disasters.

The choice of a single-colour base is at first off-putting but proves to be a wise decision. Your eyes quickly adjust and soon even the slightest change in road direction can be seen and not felt by way of a tail-slide.

On each track, bends have peculiar quirks that will wring every ounce of drivin' ability out of you. The speed track is simply (?) a matter of ever more vicious bends that have to be taken at ever higher speeds. The stunt course, though, is where real drivers head time and time again. After a near-vertical drop as a warm-up, you have to leap a vast gap to line yourself up for the loop the loop, an obstacle that subsequently leads to banked sections and even more nightmares.

It's not the course that's important, but the *Hard Drivin'* itself. Initially there are two options: manual and automatic gearchange. The former is faster once you get the hang of staying alive while changing into to fourth. For most mortals, though, the first few forays onto the track will need to rely on your CPC looking after the transmission.

Steering ain't simple either. Rather than go for an unrealistic but easy quantum-style control – where one move to the left/right puts you onto full lock – Domark has given its supercar real-life handling problems. As you find out the first time you charge into a 40 mph corner with the speedo showing three figures! Self-centering steering, the one non-realistic feature allowed to creep into the game, adds prodigously to the gameplay.



● After the loops come the dips.



● The banked section's a steering nightmare.



● The bridge jump as seen from the driver's seat.

With careful use, even potentially terminal oversteer can be corrected and made to pay dividends.

What fun is there in charging around a track in pursuit of some mythical opponent, though? The answer is... Crashing! Whenever you spin out, get T-boned or just go ape on a ramp, then you're treated to a graphic display of the resulting carnage. An instant replay facility kicks in and your car's demise is seen from a side-on view. It's almost worth trashing the tin box just to see the sparks fly!

SECOND OPINION

We've seen a multitude of driving sims recently, but Hard Drivin' *really stands out from the crowd with its amazing 3D graphics. A difficult game – keeping the car on the road is a challenge in itself, let alone doing the loops. Can be frustrating, but great fun all the same.* AW

GREEN SCREEN

Good all-round visibility.

MIKE 'MY' DAY

You'd think that programming *Hard Drivin'* was a big enough challenge for anybody in one year, but not for Binary Design's Mike Day. Not content with coding the complex 3D routines, he also found time to make an attempt for the *Guinness Book of Records*. Last year he took time out to cycle from Lands End to John O'Groats in just 14 days, 12 hours and 14 minutes, on a unicycle! This beats the previous record (and *British Rail* – ed) by nearly five days. Quite why he wanted to do this is a bit of mystery, but if he continues to put games like *Hard Drivin'* together, who's complaining?



● For your entertainment tonight, the juggling coder himself, Mr Mike Day.

Initially the game takes some getting used to and there will be many crashes on the road to challenging the elusive 'Photon'. But as with flight sims the actual difficulty makes for the challenge that drives you on to greater glory – and maybe even completing the course! The gearchange options add more difficulty for masochistic drivers with a death-wish. But *Hard Drivin'* is a game that is built around developing skill and understanding of how the car itself behaves, skid wise and speed wise.

Vastly different to the other racing games that are clogging software shelves it is unfair to compare *Hard Drivin'* to them. The game is designed for serious accident and control freaks, not just speed merchants and boy racers.

Its one major drawback, though, is the limited number of tracks. In the arcade original you went hell-for-leather on the speed track to earn another credit and then went to the stunt track for some dangerous hi-speed hi-jinks. On the home computer version, this incentive to tackle the simpler speed course is lost, leaving only the stunt track for some recreational mayhem.

Crazy, dangerous fun is the only way to describe *Hard Drivin'*. As a game it turns you and the genre of car games upside down. The obvious technical problems of coding a 3D race game have been overcome to produce an intimidating and enthralling test for the more mature speed nutters among us. Yet those who invest time and effort in learning the subtleties of the game will soon be able to complete both courses relatively quickly (in both senses) and find there is little else to do except get faster and faster.

Despite this, there will always be a space for *Hard Drivin'* in any gamester's software library, because how many other games let you play chicken with trucks and then watch the fun on replay? TW

FIRST DAY TARGET SCORE

50,000 points



● Go too fast, and you overshoot the slope.



● The stomach-churning loop the loop.



● Make it through the gate to gain extra time.



● Keep the speed up or you'll drop off.

The Verdict

GRAPHICS 81%
- □ Vector grafs at top speed.
- ■ It's one big grey area.

SONICS 62%
- □ Intro tune.
- ■ Standard revs noise.

GRAB FACTOR 63%
- □ It's fun crashing...
- ■ ...which is just as well.

STAYING POWER 82%
- □ A car you MUST learn to drive.
- ■ Only two tracks.

AA RATING 80%

□ Realistic racing of the highest calibre.

THE UNTOUCHABLES

Ocean ● £9.99 cass, £14.99 disk joystick/keys



● Elliot hot on the trail of the bookkeeper.



● Just stand and shoot on Level Three.

"You want to know how to get Al Capone? When he pulls a knife, you pull a gun. He sends one of yours to the hospital, you send one of his to the morgue! That's the Chicago way". Sound advice indeed. War has been declared on the streets of Chicago; the mob are out to rule the city and Elliot Ness has sworn to stop them. The scene is set for a showdown, Chicago style!

The only people with the courage to stand up to Capone are a crack squad of treasury agents assembled by Elliot Ness. They cannot be bought, cannot be frightenend into submission, they have no family to threaten, no dark secrets to reveal and are very hard to kill. They are *The Untouchables*.

The action is joined as Elliot busts into a bootleg brewery. As well as illegal liquor, there's one of Capone's bookeepers skulking around. Al's been a bit of a silly boy and kept detailed records of all his underworld earnings. If you can capture him then you've the basis for a case to take before the grand jury, a court even 'Scarface' can't buy!

Taking control of Ness you must pursue the bookeeper and get ten vital pieces of evidence from him, tracking and shooting him into surrender as you charge around mounds of packing crates in the huge side-view warehouse. Naturally the Capone boys aren't keen to let their employer get carted off to pris', and do all in their power to stop you. So you've got to dash around these platforms dodging their bullets and collecting evidence – all within a very tight time limit. There are extra weapons and health packs available, but it's the time that will do you in.

Following the lead from the warehouse, Ness forms the *Untouchables* and heads off to Canada for a spot of horse riding, sight-seeing and smuggler nabbing. The mob are bringing a cache of whisky across the Canadian border and have to be stopped. Guns and guts are the only tools at your disposal, as the four new colleagues face up to a veritable army of hoodlums.

Fighting on a border bridge you have to smash the whole whisky consignment using your tommy gun. The mob simply have to waste you and the team. Fighting in a lying-down position, you roll from side to side blasting away at anything. You aim using a cut-out window in the scoretable, and can change between characters just by shooting into the top right of left hand corner. This is essential, because certain *Untouchables* need to survive as they play a key role later in the game.

Level Three will seem strangely familiar, as this was the section featured on last month's covertape. Ness and any surviving *Untouchables* have to fight their way to the railway station in a desperate bid to stop Capone's accountant escaping with the incriminating ledgers – the only things that can send 'Big Al' to the slammer. This is hard and tense gunfight, that can all too easily send the treasury boys to that big exchequer in the sky.

Now it's time for yet another switch of perspective as the view changes to overhead. Elliot being the nice kind policeman type, he helps a mother haul her baby and pram up over the steps of the station just as the fire-fight breaks out. Being a butterfingered policeman with no idea about public relations, he lets go of the pram and starts blasting away. The pram bounces off down the steps and and into the middle of the battle. Your job is to kill all the bad guys, keep from getting toasted yourself and stopping the kiddie from catching too many slugs into the bargain. Touching a mobster begins to turn the kid's picture into the haunting face of Capone, and stopping a bullet hastens the process, so be vigilant.

One gangster survives and takes the bookkeeper hostage. Stone, the team's hot-shot, has ten seconds to kill the hostage taker ▸

SECOND OPINION

It's very, well, blue. But once you get into it, the varied and innovative scenes keep you hooked. RL

GREEN SCREEN

Dark and moody, but playable.



● Blast the car, before it blasts you!



● Grab that piece of evidence on Level One.

Al(fonso) 'Scarface' Capone 1899 – 1947

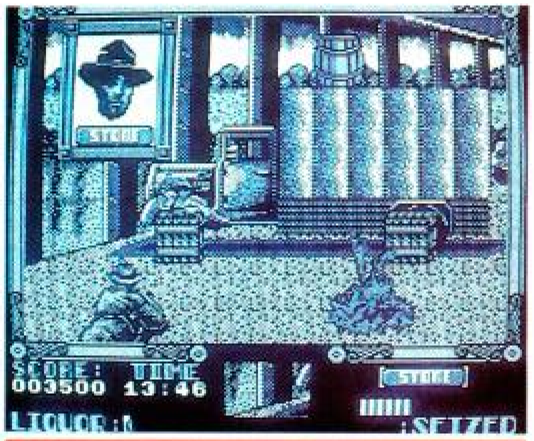
Al was born in Italy, but moved to New York as a youth. He first joined The Mob working as a bouncer. During this time he was slashed across the face, earning himself the nickname 'Scarface'. He moved to Chicago, and built himself a crime empire the like of which had never been seen before in mainland America. Bootlegging provided his main source of income, although he controlled virtually ever racket in the windy city. These exceptionally lucrative enterprises earned Capone in excess of $105,000,000 in 1927.

He was eventually imprisoned for tax evasion in 1931. He served eight years in Alcatraz, a new prison built specifically to hold this new kind of criminal. The days of Mob control itself were numbered. After his release, Capone suffered mental deterioration and eventually died of syphilis, a forgotten tyrant.



before the bookkeeper gets a lead lobotomy. Sharp shooting city! This is the shortest of all the levels, but also the most decisive, so make those shots count if you want to see Capone behind bars.

Succeed, and you get the evidence required to haul Capone into the courtroom. He still has one card to play, however, in the



● Stone starts the action on Level Two.

form of hit-man Frank Nitty, who murdered your fellow agent Malone and who's still at large. He must be brought to book, so Elliot pursues him onto the roof of the courthouse, all guns blazing. Can you beat pyschotic Nitty, or will Elliot's days end ingloriously in another alleyways-type shoot-out? Will it be a long drop for Nitty or a hail of hot lead for Ness? This is your battle, and you'll have to find out for yourself.

Graphically *Untouchables* is initially disappointing, being uniformly monochrome blue. But the sheer variety of different styles used subsequently excuses this. The three shooting scenes are similar, but are nicely interspersed with a platform game, the overhead train station extravaganza and a

The Volstead Act

Prohibition was brought in by the 18th Amendment to the American Constituition – The *Volstead Act*, 1919. It sought to ban the sale and transportation of any intoxicating liquor or beverages containing more than one half of one per cent alcohol. The law was finally repealed in 1931 by way of the 21st Amendment, when President Roosevelt declared "the nation needs a drink". The only obvious benefactors of the whole exercise were the gangsters, who introduced the words 'Bootleg' and 'Mafia' into the world's vocabulary.



RoboCop hostage situation just for good measure. The attention to detail is obvious, with touches like the inter-level newspapers which either praise or ridicule your mob-busting exploits

This mix means the gameplay is varied and intense enough to keep you plugging away until you complete each section, as you can be sure of something different next time round – failure doesn't send you back to the first level, either. Each level is accompanied by some wobbly '30s piano playing, but with a Music Off toggle you can learn to live with it. Sound effects are not the *Untouchables* strong suit and leave you wanting more to back up the great – if very blue – graphics.

The train station shoot-out is the undoubted highlight of the game, but the other levels aren't pushovers and will see many a joystick wrenched to breaking point.

The game follows the story of the film admirably, capturing the same feeling of increasing panic as team members are wiped out. This could have been a game based soley on firepower, but Ocean has resisted the



● Kill the gansters and destroy the barrels.

temptation and created instead a much more subtle game that relies on reaction speed and memory as much Magnums.

Following hot on the heels of its excellent *Batman* licence, Ocean has come up with another film classic. The company has excelled in recent years at producing multi-style epics like *RoboCop* and *Batman*. *The Untouchables* follows in the same vein, and is simply an excellent package of individual games that unite to tell a story in such a way that the pace never flags and the bullets never stop flying. Unless you want to end up on the wrong side of these enforcers, be pure, be vigilant… TW



● Level Two: Hide behind the wall to reload.

FIRST DAY TARGET SCORE

Reach Level Two

The Verdict

GRAPHICS 76%
- ☐ Huge variety of styles.
- ■ Very blue.

SONICS 68%
- ☐ Tunes at every turn.
- ■ Iffy effects.

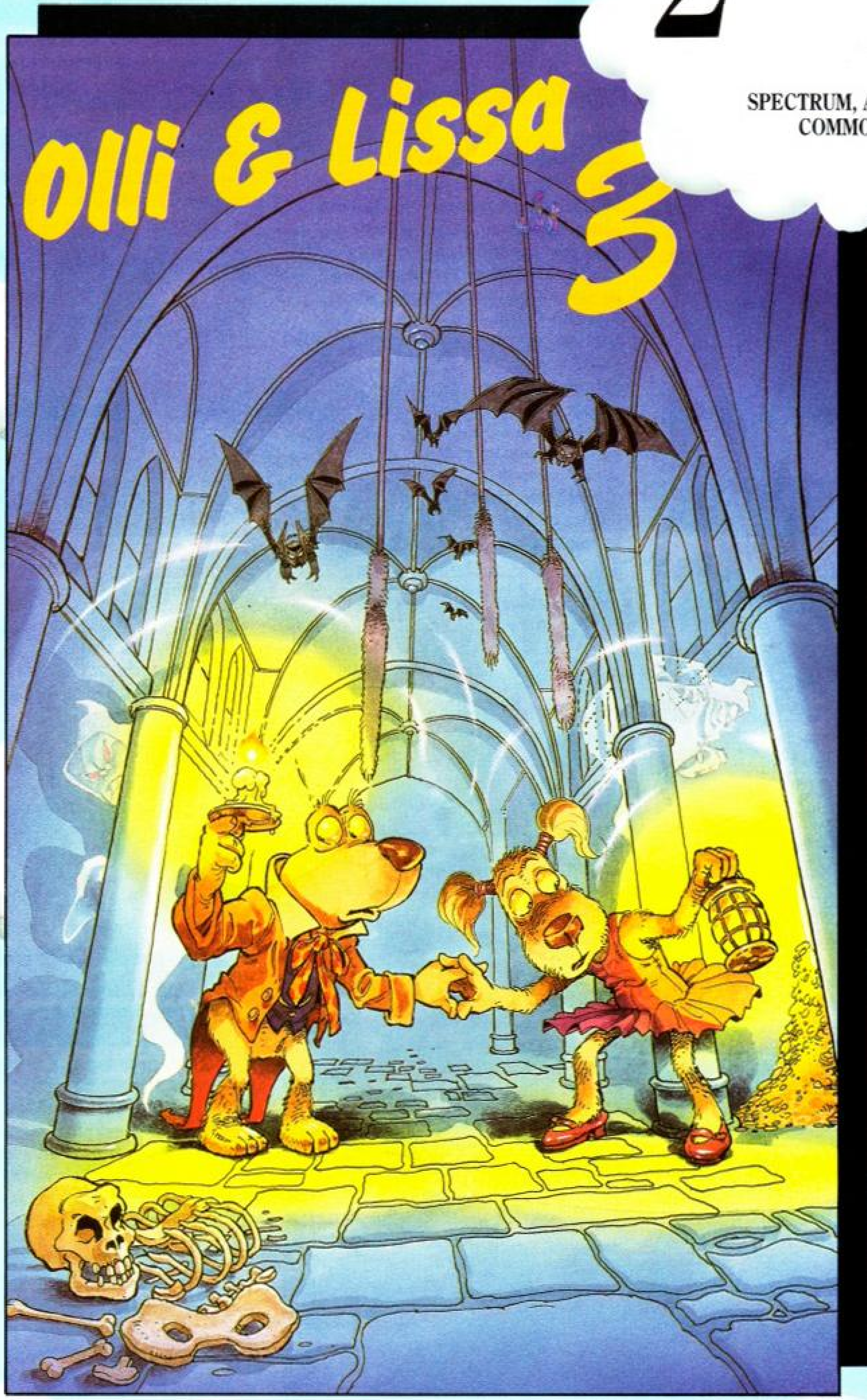
GRAB FACTOR 91%
- ☐ Brilliant but tough intro level.
- ☐ Reach a level and you stay there.

STAYING POWER ...95%
- ☐ Six very different sections.
- ☐ A very hard game to finish.

AA RATING 90%
- ☐ An Oscar-winning film licence from Ocean.

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No. 2

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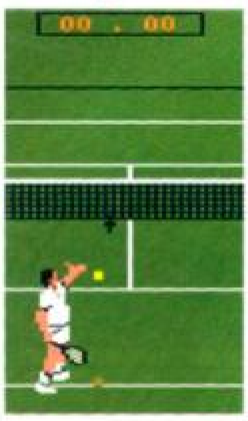
PRO TENNIS TOUR

UBI Soft ● £9.99 cass, £14.99 disk joystick/keys

"Anyone for tennis?" cried Rod as he strutted into the *AA* office carrying a racket and wearing his shiny new Reeboks. Gasps of "It's January!" and "You can't play!" abounded until he revealed his secret, *Pro Tennis Tour* from UBI Soft.

Now you may think that tennis is all about mincing around in white and shouting a lot. This couldn't be further from the truth. It's a game that involves skill, hand/eye coordination, fitness, mental toughness, jumping up and down a bit and *then* shouting. *Pro Tennis Tour* provides all this for you, bar the shouting, which you'll end up managing quite well on your own.

The game takes you on the Grand Prix Circuit of the Australian Open, US Open, Roland Garros in Paris and of course visits the place whose very name is synonymous with Lawn Tennis – Wimbledon. It may be mid-winter but now's the time to dust down your trainers, re-string that racket and get ready for some heavy-duty sporting fun. You're about to face countless different opponents on three different surfaces on your globetrotting sporting adventure.

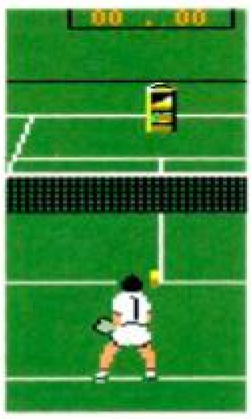


● Brushing up your service game before a match.

Pro is seen from the stands, as it were, behind and above one player. The two playing sprites, equipped with dapper shorts and rackets, have limbs of rather curious design, but it doesn't stop them moving real fast. Making them play a shot is easy – you simply press the fire button and release it when the balls gets to the right spot.

The most daunting feature of other tennis sims has been the fact that you've been thrown at the deep end. You're not familiar with the rules or the surface and suddenly you're playing the fifth best guy in the world – and getting murdered. Not so in *Pro*. Here you're given the chance to practise before you ever set foot on court. Those clever UBI Soft bods have rigged up a little machine which lobs balls at you in six different patterns to help develop an understanding of stroke-play and movement.

There's also a deserted court where you can get to grips with serving, so there's no barracking from the crowd when you miss. This is in fact entirely likely, as serving is made realistic – and much harder – by the use of cursor control. Press the fire button to toss the ball up and the guide the joystick left or right and the cursor shows where it would land if you hit it at that moment. Just let go of the button to send the ball racing away. It sounds tricky, but but it's a darned sight easier than it is in real–life.



● Practice makes perfect.

There are two types of competition to play in – Tournament and two-player. The first takes you on the tour and the second pits you against a friend (enemy?) in a direct confrontation. Two-player mode's great fun, but it gets a little confusing when it comes to swapping ends. The scoring seems a tad strange, too. Tournament play is just a matter of working your way through a tourny' until you meet someone who can actually return your serve!

The whole game is a tennis player's winter dream. The scope for improvement in your own game is vast, and dogged hours spent dodging (!) your opponents' shots will eventually pay off in victory. The practice facilities mean you stand a chance of winning, even after your first few games. It's fun and almost addictive. A well-constructed and programmed game, it means that even the most ham-fisted and physically dyslexic can play.

Yet it can only really have lasting appeal to those with a deep tennis fascination, because of the level of realism achieved. This doesn't mean that others can't play and enjoy this thorough and well thought out sim, it may even make a few converts to this strange game that has the gall to interrupt test matches on the telly every summer! TW



● The set-by-set scorecard.

SECOND OPINION

Just like the real thing – it seems impossible to hit the ball back at first, but with a bit of practice you soon get into the swing of things. Competently programmed, but a bit too difficult perhaps for all but the most enthusiastic tennis fan. AW

GREEN SCREEN

Clear as a bell.

FIRST DAY TARGET SCORE

Win an 'easy' match

The Verdict

GRAPHICS 69%
- Easily understood graphics.
- A touch blocky.

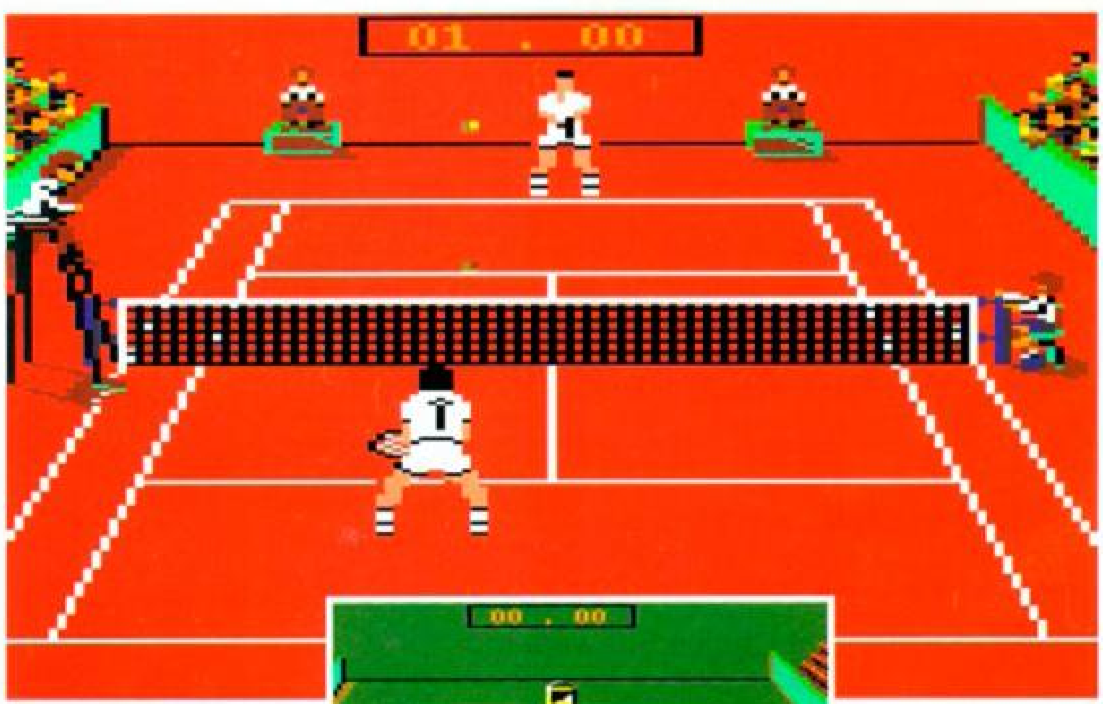
SONICS 56%
- 'Nice' theme tune.
- Unimaginative effects.

GRAB FACTOR 83%
- Simple serving (eventually).
- Practice makes for skill.

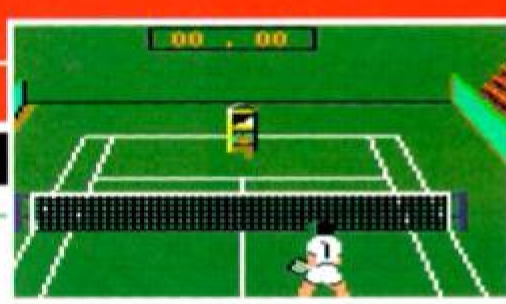
STAYING POWER 69%
- Four tournaments to win.
- Tennis buffs only?

AA RATING 72%

- Convincing tennis action.



● A match in progress.



● Practising your backhand

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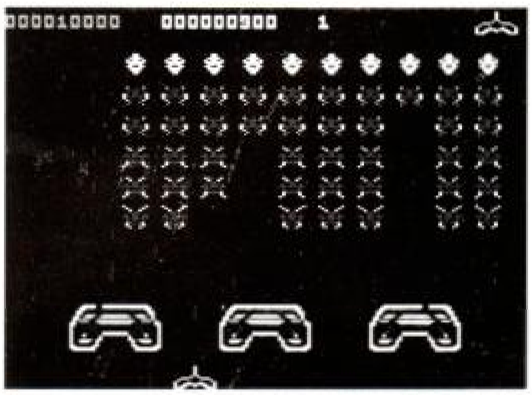
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CLASSIC ARCADIA

Alternative● £1.99 cass joystick/keys

Yes, here it is, the game that's kept the *AA* team at each other's throats all month. Frantic oaths have been muttered as we've fought it out over the high score tables of three golden oldies. *Classic Invaders, Muncher* and *Axiens* are the three games on offer, and together they make an astounding bundle.

All three are copies of more famous arcade licences – and very old licences at that. They hail from the days when aliens came at you in neat and tidy waves, when power pills let you rule the maze roost, and smart bombs weren't invented. Very basic (!), they have a magic in their simplicity that's hard to define, but impossible to ignore.



● *Invaders*: they just keep on comin'...

Classic Invaders is merely sheet upon sheet of multi-coloured nasties slowly moving down the screen, your only defence being a feeble little gun and three shields. Complex it ain't but great fun it is. *Muncher* is a *Pac Man* clone, only with smaller and therefore more difficult mazes. *Axiens* could be called *Galaxians* if copyright would allow, but what's in a name? The game's the same, pure and simple arcade fun. All three games have the speed of the originals – and then some.

Gameplay hadn't even been thought of when these games were written and yet it doesn't seem to matter. Fast and furious copies, these are more than a match for their arcade parents of yesteryear, and at such a ridiculously low price who could afford to be without them! TW

SECOND OPINION

Anyone under the age of 20 probably won't remember these golden oldies. These are the games that started it all – with playability that you'ld be hard pressed to find in many more modern games. ***AW***

GREEN SCREEN

Still brilliant!

FIRST DAY TARGET SCORE

Invaders: 50,000 points
Muncher: reach Screen Four
Axiens: 10,000 points

The Verdict

GRAPHICS 20%
■ Graphics look as if they go back to the stone age...
□ ...but who cares?.

SONICS 50%
□ Nice tunes.
■ Blip effects.

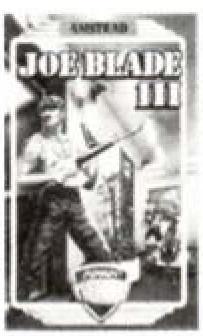
GRAB FACTOR 95%
□ Instant adiction.
□ Appeals to all ages.

STAYING POWER ... 81%
□ True classics.

AA RATING 79%
□ Simple, naive charm.

JOE BLADE III

Players Premier● £2.99 cass joystick/keys



Horror upon horror! Six TV celebrities have been kidnapped by the evil Crax Bloodfinger and he's demanding $100 billion dollars for their release. Who cares about a bunch of minor stars and TV link men? *Joe Blade* that's who, the world's shortest superhero.

Bloodfinger has stashed the celeb's away in a fortified tower block 30 stories high. *Joe* must rescue the six hostages, and defuse six bombs. On the course of his adventure it will also be necessary to hack into the building's computer to find objects, and break through security doors when he hasn't got a key. There are various helpful pieces of kit scattered around to help out, like disguises and bullet proof vests, if you can find them.

The game involves you taking *Joe* through a horizontally scrolling maze clearing it of bad guys, collecting things and rescuing people. Your man can run and jump fire his gun and... well, precious little else. The maze is huge, the objects of your search few and far between, and negotiating a route to them is made all the more difficult by the absence of any kind of directional indicator. The real heart of the game are the computer hacking and lock-breaking sections. You frantically juggle numbers to gain access and avoid capture, but there's really little excitement even here.



● 30 levels – but can you tell the difference?

The weakest point has to be the graphics. They are of a quality that would make a Speccy owner outraged. Single colours and line drawings are all you get, and they are far from breathtaking. The game looks exactly like its predecessors – hardly a recommendation!

Other budget titles have run and run, ostensibly using the same routines for each generation – e.g. *Dizzy*. These add to the original concept, becoming more complex gamewise, using the time saved 'coding' the basics to further tweak other aspects. *Joe Blade III* fails in this respect, remaining in the same league as the two previous *Blade* outings, tedious and confusing maze adventures with little pace and no real action. TW

SECOND OPINION

I've never understood how the Joe Blade games came to be as popular as they did. Shallow gameplay and repetitive screens make for a dull, uninspired bore. ***AW***

GREEN SCREEN

No difference as there's no real use of colour anyway.

FIRST DAY TARGET SCORE

Rescue a hostage

The Verdict

GRAPHICS 35%
□ Souless Speccy port.
■ Identical to *I* and *II*.

SONICS 45%
□ OK-ish tune.
■ Guns just go 'Phutt'.

GRAB FACTOR 45%
□ Midly interesting...
■ ...but soon gets dull.

STAYING POWER ... 30%
■ 30 levels to explore...
■ ...if you can muster the enthusiasm.

AA RATING 30%
□ Unoriginal sequel.

TEST DRIVE II - THE DUEL

Accolade ● £9.99 cass, £16.99 disk joystick/keys

There's this Ferrari F40 and Porsche 959, you see, and they're racing across America... What do you mean, you've heard it all before? This is a new game, honest!

What must be the world's two most battered supercars are once again wheeled out for another head to head race across the 55mph roads of the US of A. The kid gloves are off and the driving gloves slipped on, for a race against the other car or the clock in what sets out to be a true driving sim rather than a go-faster boy-racer arcade blast.

GROUP TEST

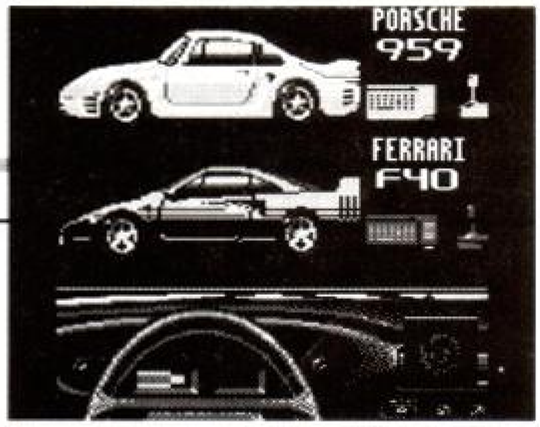
***Test Drive II* is an original (i.e. not licensed) product, and yet it shows a distinct lack of innovation. It fails to match the sheer crazy fun of of *Power Drift*, ias pipped to the post by *Turbo Out Run* and fails miserably to out-sim *Hard Drivin'*.**

Once the flag goes down and the race begins, you can drive either the Ferrari or the Porsche to breaking point and beyond. True to the simulation theme, you are placed behind the windscreen rather than the car, so you can watch the dials and gears in 'situ' as it were. This limits your view, but is more realistic – and besides, what is there to see at 190mph?

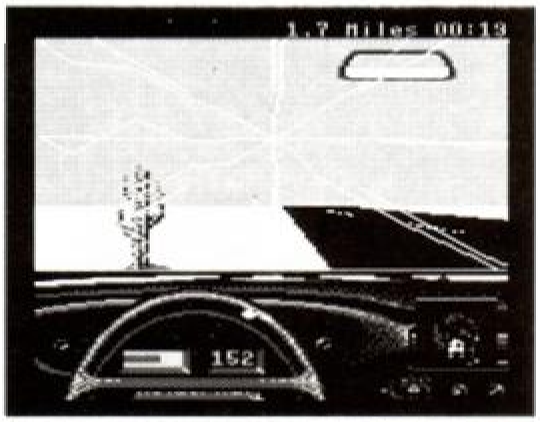
In front of you is lurid yellow desert, with the two-lane blacktop scything across the landscape. A quick glance in the mirror tells you it's time to go as your competitor's gunning his engine behind. The sound effects grumble from a subterranean grumble to a feeble rasp like a bee with a grudge, and your motor slowly, slowly, picks up pace. The speedo and the actual speed of the car seem to have little in common, which leaves you relying on gut instinct but isolated from the game.

Both cars handle like Rod's Skoda (*How many more times? I don't have a Skoda! – ed*), with a massive tendency to oversteer at the slightest hint of a bend. This is something you're constantly adjusting as you scream (eventually) along the highway. The first stage is simple flatland excursion, and the second takes you to the more interesting and perilous mountains, complete with tunnels and long drops. Hazards come in the shape of trees, your competitor and other slower (yes, slower) cars. You must complete a set distance before running out of gas while driving as fast as possible. That's as exciting as it gets, a fast drive through some pretty featureless countryside amidst a host of real bad drivers and roadhogs.

The driving is controlled by either joystick or a particularly odd set of undefinable keys, making life even harder. This driving control lark proves to be simple idea that's rather hard to execute. You're supposed to push forward to accelerate, back to brake, press the trigger to change gear etc, but that's not the problem. For a game that aims to recreate the sensation of driving wildly powerful machines, there is precious little to do and when you do try to make something happen it takes ages to show up on-screen.



● Which to choose – Porsche or Ferrari?



● Wallop! – you hit the cactus. (Yes, that one 65 yards away...)



● You don't just have to stay on the road, you have to keep to the right side too!

SECOND OPINION

***"The car's hard to control, the backdrops are tedious single colours and the course unexciting. Little improved over the original."* RL**

GREEN SCREEN

No loss.



● Life gets tougher in the mountains – that cliff is *very* solid.



● Reaching the end of the stage.

The major irritation is the horrendous collision detection that plagues even the most sensible overtaking manoeuvre. The standard way of burning someone off in motor sport is to approach directly from behind, disguising which side you're going to pass them on. In *Test Drive II* this is impossible as your windscreen shatters – signifying a crash – when you're ten feet behind their rear bumper...!

The featureless landscapes are too flat, and offer too few reference points to provide the illusion of speed. The other cars are unclear and jumpy, which makes avoiding them the only sensible course of action. This spoils the game, as you're reduced to staying on the road and out of the repair shop rather than racing.

There are plans to introduce a further set of tracks and cars as supplementary software for the game later in the year. Let's hope the variety's a bit more marked than that shown between the Porsche and Ferrari.

With so many car games in recent months the competition has suddenly become a lot tougher and more is expected from both graphics and gameplay than ever before. *Test Drive II* unfortunately doesn't deliver on either score. TW

FIRST DAY TARGET SCORE

Complete Stage Three

The Verdict

GRAPHICS 54%

□ Ambitious attempt at simulation.
■ Dull landscapes.

SONICS 03%

■ No music.
■ 'Bee'-like engine noise.

GRAB FACTOR 56%

□ Appealing, if ageing, idea.
■ Hard to control.

STAYING POWER ... 45%

□ Long roads to travel.
■ Lacks impetus.

AA RATING 44%

■ A game that stalls on the grid.

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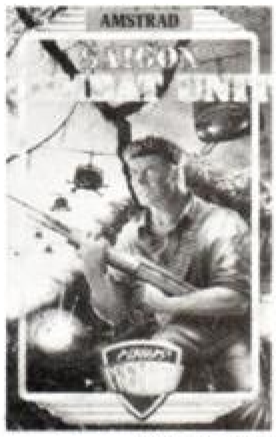
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SAIGON COMBAT UNIT

Players ● £2.99 cass
joystick/keys



What a title – you can almost smell the early morning napalm! Once again you're whisked into the land of 'Nam for some for some vocational violence at the expense of the VC. The boys in black pyjamas have been and captured your CO and taken him deep inside the DMZ. As the NCO you must ensure his 'evac' ASAP before he spills all manner of CIA secrets. OK?

Armed with your ever-faithful M16, your mission is simply one of rescue. You walk through a horizontally-scrolling city and junglescape blowing NVA and VC away until you're KIA. You've grenades and almost limitless ammo but they know the territory and have set ambushes and traps along the way. It ain't gonna be easy, but what kind of work did you expect joining an outfit like the *Saigon Combat Unit*, KP? (*YF! – ed*)

The graphics are bright and solid, the shooting slow but sure. All the action centres on keeping your GI Joe alive as long as possible and collecting as much dosh as possible from the bodies of the dead – pretty morally unsound, but that's 'Nam. The money is necessary because every now and then you meet an arms dealer who lets you upgrade your weapons system. If there's one thing that you can be sure of it's that the USMC is never outgunned!

The game plays well, but so it should as it follows in a long line of horizontal shoot outs and adds nothing new. The nice look of the product will help its popularity but the game fails to capture that necessary spark of individuality to make it memorable. Its title alludes to the peculiar madness that was the Vietnam, but the lunacy is not translated into gameplay, leaving a rather run-of-the-mill, if thoroughly competent, war game. And one where senseless violence is not only fun but lucrative. **TW**



● Could be *Berlin Wall Sim* next month...

SECOND OPINION

"Personally, I found the whole thing so ideologically dubious I hardly wanted to play at all. Competent enough, but dull. " **RL**

GREEN SCREEN
A-OK.



● All dressed up and no-one to kill!

FIRST DAY TARGET SCORE

10,026 points

The Verdict

GRAPHICS 64%
☐ Jolly little sprites.

SONICS 40%
☐ The usual effects.

GRAB FACTOR 67%
☐ You get to kill things easily and quickly...
■ ...but that's it!

STAYING POWER ... 52%
☐ There's a lot to kill.
■ Little variety.

AA RATING 60%

☐ Reasonable combat fun at a good price.

THRILL TIME – PLATINUM 1

Elite ● £12.99 cass, £19.99 disk
joystick/keys

Just when you thought you'd heard the whole *Story So Far*, yet another compilation wings its way out of Elite HQ. A massive pack of ten games, it comes in an attractive pack, all tinted in eponymous platinum, and looks a sure-fire winner. But why should you shell out nearly £20 for a history lesson in CPC games?



On the plus side there are four obvious reasons; the classic *Ikari Warriors*, the fast and furious *Thundercats*, the Bond/Domark connection in *Live and Let Die* and the absolutely 'spiffing' *Space Harrier*. Together they provide all the blasting fun you could wish for, especially when supported by strong if not famous little numbers like *Buggy Boy* and *Beyond the Ice Palace*.

The downside of the collection, though, is equally apparent. All the games are old, the most recent being *Live and Let Die* which was released way back in *AA37* when Gary 'GBH' Barret still ruled the reviewing roost. Not in itself a crime as there are many old games that can still make the grade – just look at *Elite*. But with Elite – the company, not the game – releasing ever more compilations under its *Story So Far* series, and its budget label Encore continually raiding the back catalogue, there is precious little here that hasn't been re-released already.

If you haven't got *any* of the games on the list, *Thrill Time* would make an exciting addition to your collection. However, it must be asked how long Elite can continue to churn out a finite amount of product re-packaged an infinite number of ways. Elite has turned out some really stunning games for the CPC in the past, so let's hope that this retrospective phase is but a breathing space before the company throws itself wholeheartedly into the world of *new* games once again. **TW**

The Verdict

Buggy Boy	70%	*AA29*	
Space Harrier	90%	*AA17*	Rave
Live and Let Die	80%	*AA39*	Rave
Overlander	61%	*AA37*	
Dragon's Lair	67%	*AA20*	
Thundercats	90%	*AA27*	Rave
Beyond the Ice Palace	77%	*AA33*	
Great Gurianos		Not reviewed	
Hopping Mad	62%	*AA35*	
Ikari Warriors	91%	*AA16*	Rave

AA RATING 63%

☐ Some real classics...
■ ...that are suffering from over-exposure.

AIM FOR THE BEST



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The Hit Squad

ROCK 'N' ROLL

Rainbow Arts ● £9.99 cass, £14.99 disk

Rolling stones may gather no moss, but rolling spheres gather points by the bucket load. Or they do in *Rock 'n' Roll*, a seven-continent maze world full of goodies to keep and collect. Its basic premise couldn't be simpler. The aim is to successfully – i.e. remaining alive while you're doing it! – negotiate seven different mazes, each constructed of various levels. There's no strange or slightly ludicrous plot to excuse this, just the spirit of adventure.

The aim of any prospective *Rock 'n' Roll*-er is to have fun and find out as much as possible about the weird world in which he/she/it lives. This involves solving puzzles, avoiding pitfalls and learning the sequence in which objects must be collected to be of any use. Graphically and musically it owes a lot to *Skweek*, being cast in a cartoon light with jolly little tunes nagging away as you play.



● The decaying floors can trap you.

That's it, all you have to know in order to go *Rollin'*. The fun begins in 'yellowland' with a locked door staring you in the face (if you had a face, that is!), so the first thing must be find the key. Scooting about reveals a small compound area, with a different colour key to that of the door, the only thing you can find. There is an odd glowing globe in one corner, however. Curiosity gets the better of you and eventually you touch it. Before you can say 'beam me up Scotty' you're whisked away to another area where eventually you find the right coloured key. Touch the teleport again and you're back where you started – but now have have to power to move on.

Using teleport systems isn't the only trick you'll need to learn before you make it to the

SECOND OPINION

Plays like a mouse-controlled game without the mouse. Bright and colourful but not a new theme, and not terribly well implemented. AW

GREEN SCREEN

Key colour is hard to decipher.



● Those ice floors are real tricky.

Rock 'n' Roll hall of fame, though – they're the easy bits! Lying around for you to collect are purses of cash that enable you to buy goodies at shop squares. Of course each shop only sells one item and can only be visited once before it sells out. So careful budgeting and use of the articles is essential. On offer are repair kits, parachutes, armour, spikes and many other treats to keep you amused and amazed for hours on end.

Now these goodies are only on offer every now and again but they do serve as a warning to what's ahead. So when you see a shop, stop and buy something! It's the closest you'll get to hints. Among the traps, some of the more common are decaying floors and patches of ice. Repair kits are necessary to patch up the holes and allow you past (parachutes float you out of danger if you stray over a hole), and ice requires the use of spikes to stop you sliding uncontrollably towards a hole.

One-way arrows, time delay gates, slopes and a myriad more fiendish plans have been hatched to stop you completing the level. Keys are invariably the hardest things to find,



● The fiery volcanoes sap your energy.

often being hidden up long thin corridors with floors that becomes holes the second time you touch them. This makes retrieval a little tough as you roll over them for the second time on your return journey, so speed is essential.

Thus life continues until you get trashed or stuck. You can restart from the same spot, but if you manage to work yourself into an inescapable corner than you have to abandon the whole match and restart form the dimly-remembered start of the level. Arrggghhh!

The many items to collected on your trek through this perilous land are displayed on a neat but small window below the main game screen. Keys are identified with their respective colours (making play tough on green-screeners) and all the bonus goodies are simply scrolled through before use. The main screen itself has multi-directional scrolling to create the illusion of ball movement, while the choice of bright basic colours and less-than-subtle shades helps keep up the game's jolly grimace.

RnR looks very good, sounds pleasant and plays well, but just isn't fun. There's plenty to do, but seemingly little motive to actually do it. The packaging makes a boast of not having to fend off hordes of invading nasties, but without the threat imperative or immediate time limit, on most levels you can dawdle around for as long as you want. Even the decreasing amount of energy isn't enough to rescue the game from increasing dullness. Great work, but the game it's centered on doesn't have the character to carry the code.

TW



● A hip 'n' trendy rock and roller.

FIRST DAY TARGET SCORE

Get past the volcanoes

The Verdict

GRAPHICS **76%**
- Bright cheerful and clear.
- Smooth multi-directional scrolling.

SONICS **75%**
- Many jolly jingles.
- A touch irritating.

GRAB FACTOR **74%**
- Instant appeal.

STAYING POWER ... **54%**
- Vast maze of many levels.
- Exceptionally frustrating.

AA RATING **63%**

- Nice coding but a weak premise.


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DAN DARE III

Virgin Games ● £9.99 cass, £14.99 disk joystick/keys

Old square-jaw is back! *Dan Dare III*, comic book hero circa 354 BC, has been resurrected once again to shoot around the stars and save the universe from that viscious Venusian, Mekon. The green star Command Overalls are out of mothballs, the plasma rifle out of hock, that stiff upper lip out of starch, and he's ready to go for his third CPC adventure.

Dan finds himself stranded on the planet of the Treens, Mekon's slaves. He needs to find enough fuel to blast off and escape, but he's going to have to fight for it. Littered through out the place are various space nasties, goodies and transporters, all of which have to killed, collected and used respectively. Can the star of comic capers past make good again and survive this stern test? By jingo Digby, we jolly well hope so!

The world is a platform complex that has to be reached by way of leaping around with the aid of a jet pack. In his hands *Dan* carries a plasma cannon, and he has a few other toys in his rucksack. His first task is to find a way to the next level and a way to tool up.



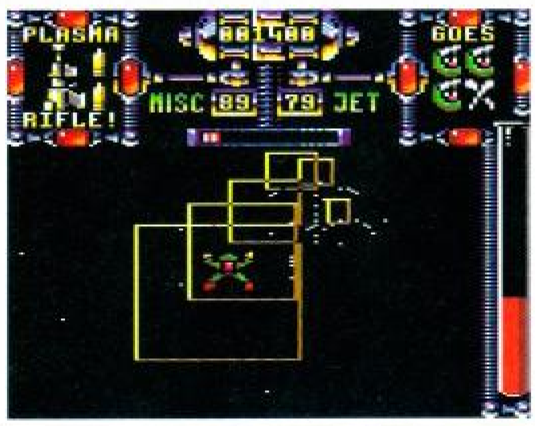
● Mekon feels the power of a 'Nuke Enemies' bomb.

Part one of this challenge is simplicity itself. All the boy has to do is fly over and blow a huge Mekon statue to bits. This gains him the Pod to the next level, which allows activation of the transporter. It also gives him access to a jolly decent little shop where one can buy everything from 'Nuke-'em smart bombs' to extra lives.

Then it's a case of clearing out the rest of the level of alien slime, topping up the jet pack fuel tank and venturing on to the next stage of the mission. All the fighting is done quickly and easily by selecting a weapon, pointing *Dan* and pulling the trigger. Shots can be fired in small repeated bursts or be built up *R-Type*-style. *Dan* either runs, flies or floats around, occasionally stopping to get kit or turn switches. All very simple, but a sound foundation for a game.

Transporting, however, is a totally different kettle of space fish, and introduces a frightening element of chance. Sending *Dan* between levels is strictly necessary. The only way he'll ever get enough ammunition to kill all the enemies is to continually visit the stores (start level) again and again.

You fly between levels, but the route is fraught with danger. *Dan* appears spread-eagle in front of you, with a tunnel of concentric squares rushing closer. *Dan* must be guided safely through the centre of every square or his life force bar suddenly takes a huge drop in power. The problem is the speed with which the squares zoom in, and the eye-numbing way they overlap, cunningly disguising the correct and safe route. Die and you go back to the transporter you've just left, succeed and you know the only way out is by returning the same way!



●The outrageously dangerous transport system.

Probe software is responsible for this latest epic, and it shows in the graphics, which are both cute and humourous. Dan has a certain individual indentity that's backed up with weird and wonderful aliens. They serve to embellish a game already crammed with subtle and intriguing features that are only revealed after intense experimentation. The style is simplistic but never basic, and the result is a bright and bold shoot-em-up that stresses gameplay.

The transportation scenes are the speciality of *Dan*, though, being very tough to begin with and far from easy even after practice. They manage to make a simple idea work effectively, enhancing strong gameplay and turning a straightforward platform blast into something much more fiendish. The balance between strategy and violence is finely judged to maintain the widest possible appeal.

The licence itself may be more than dated, with fewer people than ever knowing (or caring) who *Dan Dare* is – but it doesn't matter. The result of the effort is an instantly entertaining puzzle-based shoot-em-up, that looks good and plays fast. It becomes increasingly difficult and may not have the long-term interest promised in those first few games, but the travelling between levels repeatedly injects heart-stopping moments of panic, no matter how good you get. *Dan Dare* may no longer be the pilot of the future, and maybe nearing retirement age, but he still knows how to have a good time

TW



● A tough spot on Level Two.



● Blasting Mekon on Level One.

SECOND OPINION

"Bright, colourful and fast, Dan looks a little messy occasionally but still has instant appeal. Whether there's really a great deal of long-term gameplay is another matter." RL

GREEN SCREEN

Looks spiffing.

FIRST DAY TARGET SCORE

Reach Level Three

The Verdict

GRAPHICS **77%**
- ☐ Clear and amusing sprites.
- ■ A touch blocky on the explosion front.

SONICS **63%**
- ☐ Thorough effects.
- ■ No music.

GRAB FACTOR **84%**
- ☐ Instantly appealing
- ■ Lots to do immediately.

STAYING POWER **67%**
- ☐ A long and hard mission to complete.
- ■ A touch limited in variety.

AA RATING **79%**

☐ Cheerful comic capers.

JACK NICKLAUS GOLF

Accolade ● £9.99 cass, £16.99 disk joystick/keys

Golf is one of those rare sports that's actually easier to play on a computer than in real life. You're given a bevy of helpful hints and advice, and a bad shot doesn't entail hours of scratching around looking for the darned ball!

All the usual bits and bobs are here in *Jack Nicklaus Golf* but there's much, much more besides. You take to the course with a variety of options relating to skill level and number of players etc, but then you immediately have the choice of three whole courses, a practice driving range and putting green to dig your club into. The package is bound together by Uncle Jack's comments on your performance, some of which are none too complimentary.

The three courses are ones either designed by Jack, or part of his personal ultimate course cobbled together from many world famous golfing venues. Castle Pines in Colorado is a lush green parkland that has more trees than you dare to imagine at the first tee, while Desert Mountain is a course that was built in the arid Arizona wastelands, where the sand still runs on either side of the fairway. *Jack's* 18 are the best, however, as you're taken around the world in 18 holes (immediately recognisable from watching too much Grandstand). All the holes appear in plan and 3D. They are full of character and look convincingly tough, although to get the graphic realism right, the speed with which they're drawn results in long gaps between shots.

On the left of the screen sits the all-important power bar that determines how hard you hit the ball. Underneath is a wind meter, while below the course view is the club selected and the stats on the hole itself.

Driving down the fairway to start with couldn't be easier, you simply watch as the swing builds up power and hit fire when it has enough welly on it to send the ball where you want. Then watch the bar speed down trying to judge how much slice or hook you want on the shot. Well that's the theory, but throw in the wind factor and the devious design of most of the holes and you know golf ain't the cakewalk it first appeared.

The impressive 3D effects add extra difficulty to the game by introducing rolling hills and dales for your round. So remember that the flag may be hidden by the lip of bunker in which you've buried your ball, as well the huge pine tree in front of you.

Add these factors to the array of computer opponents and the styles of game and you know you're in a real golfing experience. The choice is between stroke play, where it's your final total that matters, or 'skins', where you have a rolling jackpot for each hole. Both demand different approaches and both are tough to win. This is doubly so if you're foolish enough to take on any of the computer players. They vary in their ability, but are all pretty hot. You can even play Jack himself if you really want an ego-bashing!

The fun in *Jack* comes from the ability to build up golfing skill as you play. The first few rounds are merely research – only afterwards does the real game begin. Each hole needs a definite technique, which is outlined in a terse comment from Uncle Jack as the course map is unfolded. Listen and learn – the advice is invaluable!

However good the package – and it is very well put together – it will, however, only immediately appeal to those people who have played computer golf before, or are keen followers of the sport. These limitations will unfairly cripple the game's popularity – a crime, because it's an entertaining and well-programmed sports sim. The head-to-head match for cash injects enough excitement to win over the most diehard anti-golf fanatics. (If you can get them to play in the first place!)

Jack sets standards that make even the *Leaderboard* pale in comparison. The graphics are convincing and give each a course personality that's reflected in the way it plays. The golf mechanics are easily understood, and complete novices can be playing within minutes – but the game does demand maximum concentration if hopes of a par round are to be kept alive.

So if you've ever wanted to try your hand at golf but been put off by the silly trousers, now's your chance for glory.

TW



● Superb scenery sets the backdrop for an excellent golf sim.



● A perfectly-timed "wallop" (golfing term).



● Trenton's arthritic follow-through



● On the green, and a tricky (for Trenton) 4ft putt.

PAR FOR THE COURSE?

Leaderboard has been the benchmark for golfing excellence on all formats since time immemorial. There have been many competitors, but only *Jack Nicklaus* stands out from the crowd.

What makes the sport such an ideal target for computer games is its stationary nature. The guy in the funny jumper and plus fours stands still, hits the ball and then reappears further down the course. Hardly any animation, and just the courses to worry about. Complex maths are required to work out how far the ball travelled and where it landed, but with little code for animation there's plenty of 'K' left to muck around with.



The first few forays onto the course came way back in *AA* 1 when Amsoft brought us *Amsgolf* 67%. It scored well as the first game of the genre to be seen by *AA*. This was quickly followed by a horde of immitators, most notably *Nick Faldo plays the Open*. This scored a round of 65% which was below par when compared to the Amsoft original. The stage was set for a dramatic improvement, though.

*AA*20 saw the birth of a games phenomenon called *Leaderboard*. This scored a massive 83% and bought golf into the computing age. You saw your player prepare his shot, and used a bar indicator to control swing, slice and power. The whole course was seen from eye level and the graphics were incredible for their day. The only drawback was that the areas off the fairway always counted as out of bounds, giving you no chance to recover from an errant shot.

This all changed when the series peaked with *World Class LeaderBoard* (*AA*28 83%) which at last introduced incidental items such as trees and bunkers as visible, tangible obstacles for you to play around. It used the same control system as its predecessor, but relied on graphic prettiness to provide impact. This game too introduced the concept of 'add-on courses' to the market and the idea, it seemed, was finally done to death as replicas of the world's great courses appeared.

US Gold capped its moment of glory by producing *LeaderBoard Par 3*, a truly staggering collection of its golf sims' greatest moments. Interest in the sport since then has been muted. Even with outstanding international success, licences weren't sought. It looked like the end of the road (fairway?) for golf sims.

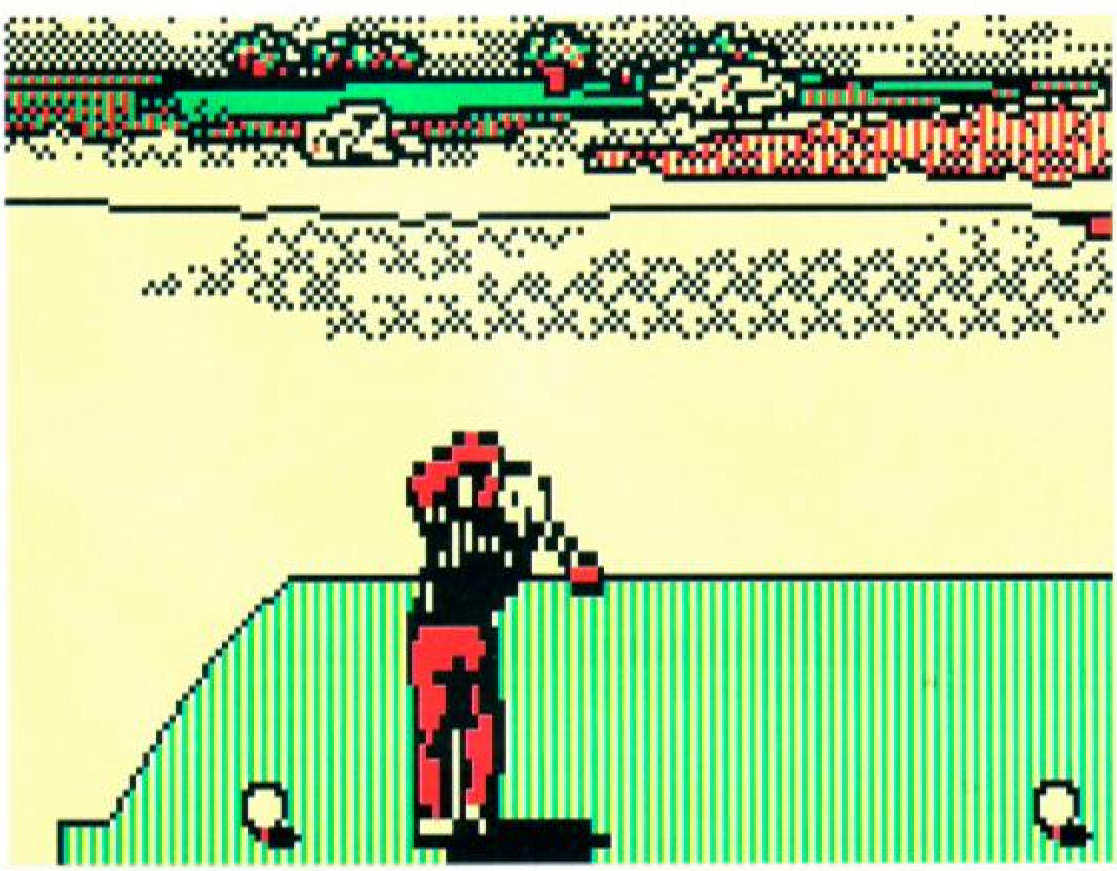
Then out of the blue up pops *Jack Nicklaus* and you know that you're in a different league altogether. Golf takes place in beautiful locations and now you can walk the course and actually see them. Uneven ground, sunken bunkers and huge trees conspire to stop that winning round and you know there's a lot of life left in this old dog yet. Golf's back on the CPC. Thanks *Jack*!



● Rod Nicklaus drills the ball down the fairway.



● Lining up a tricky putt.



● Teeing off on the 18th (and about 234 over par)

SECOND OPINION

"A truly excellent golf sim, streets ahead of anything else. In fact, it's enough to make non-golfers buy a set of clubs!" **RL**

GREEN SCREEN
Still clearly superior.

FIRST DAY TARGET SCORE

A five over par round on Beginner

The Verdict

GRAPHICS 84%
- ☐ Awesome course detail.
- ■ Slowly drawn.

SONICS 05%
- ■ The occasional 'phutt'.

GRAB FACTOR 88%
- ☐ Golf made easy (on the lower skill levels)
- ☐ Three different courses.

STAYING POWER 88%
- ☐ 54 holes to master.
- ☐ Multiple computer opponents, two styles of play.

AA RATING 89%

- ☐ Beyond a shadow of a doubt the best golf sim ever on a CPC.

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Playing with Protext

Or, Putting Things Together. PETER CERESOLE concludes his short series on *Protext* by launching into loaders...

As this is the third piece about *Protext*, it seems sensible to see how the gems of wisdom from the previous bits fit together – and what the consequences are. This means looking at the loader, which is in BASIC (ugh!). And that means looking at some history (hooray!).

Tote a heavy load

The loader is in two parts, "disc", and "d2". There are reasons for this division of labour. Later, all will be clear as wet cotton wool. But right now, what does it all do, and why?

- Lines 1 to 6 set up the KDS 8-bit printer port interface. This makes the CPC into a Little Blue machine.

- 16 to 53 redefines the function keys, mostly to give single-stroke printer control codes.

- 54 to 108 sets up macros, and assigns them to keys

- 110 tweaks *Protext* to run the way I like, and sets the screen to Serious Colours.

...so far so obvious...

But 1000 to 1180 is odd (and deeply, deeply wonderful), and needs some history to explain it. So let's start at the end.

History is Bunk

[Okay, I know he didn't say that. But "*Protext*, as it is described in the manual, is bunk" wouldn't fit on a header. Anyway...]

- Sarajevo, 1914. Gavrilo Princip shoots the Archduke Ferdinand, and the result is the First World War.

- London, 1988. I have a problem with *Protext*, so I call Arnor, and they say "why don't you join WACCI, somebody there is bound to know."

What the heck was WACCI? And would it be nicer than World War 1? Well, WACCI is a CPC club that exists through its magazine – that's how the members meet, by writing in. And they do have a lot of friendly techies. Ask the right bloke the right question, and you may well get an answer. At least, that was the idea.

This was my problem:

REM Lines 1000 to 1180

I have a CPC with two drives, and *Protext* hanging off the back with *Promerge*, *Prospell* and *Utopia*. I normally keep my *Protext* loader disc in A:. It also has a lot of useful formats on it for various letters, scripts and things like that, plus different box drawing programs, and on the other side there's the Dictionary. So I keep all my text files in the B drive.

I wanted to fire up (run"disc) from drive A and have *Protext* log onto B if there was a disc in there, otherwise not. I wanted to do this automatically. A year ago, I thought I'd try to do something about it.

10 ON ERROR GOTO 20
20 WACCI

So I put |B into the loader program, and "on error goto" a line that said |A. This didn't work. "On error goto" doesn't catch the "Disc missing" error. "Retry Ignore or Cancel?" kept on holding up the smooth flow of action. After three years of using *Protext*, it was a dodge I really wanted to get going.

So I joined, and the Editor of WACCI printed my plaintive letter. He also pointed out that all it took was B <Return> to log onto the drive, but this was unhelpful because although he was *right* it wasn't *fun*. The problem with Steve Williams (for it is he) is that, although he'd deny it, deep down he probably thinks that humans behave rationally. Wrong. Believe me.

You could have heard 24 pins drop. Not a whisper. I tried in *ACU* (*that's enough of that – ed*) too. I was enjoying WACCI, but no solution came out of the aether, or out of the membership either.

Then Steve published the WACCI helpline numbers, and I called a quiet genius called Stewart Peppiatt. This was a Good Move, because Stewart fixed it for me. It so happened that in this case – after a false start – he had the solution in his back pocket. Within a couple of days he'd sent me a bespoke type-in, and like all the best ones, it worked first pop.

If there is a disc in drive B the routine returns 1 to &bf32. If the drive is empty, it traps the error message, and returns 0. That accounts for line 1180 in the loader: if PEEK(&bf32) is 1 then it is TRUE and the machine logs onto B. Otherwise it stays logged onto A.

I can't over-emphasise the pleasure that this small and silly fix gives me every time I fire up. It's just that little less faffing about and it's lovely.

DISC

```
1 restore 1:symbol after 256:memory himem-
  30:m=himem+1                          'kds Mk 2 set-up
2 for q=m to m+25:read a:poke q,a:next
3 m=m+4:for i=0 to 2:poke q+i,peek(&bdf1+i):next
4 h=int(m/256):l=m-h*256:poke &bdf2,l:poke &bdf3,h
5 data &fe,&0a,&37,&c8,&f5,&07,&30,&11,&06,&ef,&af,
  &ed,&79,&cb,&c7,&ed,&79,&cb,&87,&ed,&79,&cb,&c7,
  &ed,&79,&f16 poke &bd31,&c3:poke &bd32,&2b:poke
  &bd33,&bd:call &bd58
14 |TOKENS, 250
   'Makes some room for what follows
16 KEY 0, CHR$(24)+"q"                  'NLQ
18 KEY 1, CHR$(24)+"u"                  'underline
20 KEY 2, CHR$(24)+"b"                  'bold
22 KEY 3, CHR$(24)+"s"                  'subscript
24 KEY 4, CHR$(24)+"e"                  '12 cpi
26 KEY 5, CHR$(24)+"n"                  '10 cpi
28 KEY 6, CHR$(24)+"t"                  'superscript
30 KEY 7, CHR$(24)+"i"                  'italic
32 KEY 8, CHR$(24)+"c"                  'condensed
34 KEY 9, CHR$(24)+"l"+chr$(24)+"r"     'large
36 KEY 10. "user "                      'user change
38 KEY 141,CHR$(24)+"h"                 'enhanced
40 KEY 142,CHR$(24)+"o"                 'Souvenir
42 KEY 143,CHR$(24)+"v"                 '12 cpi hi-speed
44 KEY 144,CHR$(24)+"k"                 'Super focus
46 KEY 145,CHR$(24)+"j"                 'Courier
48 KEY 146,CHR$(24)+"m"                 'OCR-B
50 KEY 147,CHR$(24)+"w"                 '15 cpi
52 KEY 148,CHR$(24)+"s"+CHR$(24)+"c"    'tiny print
53 KEY 156,CHR$(24)+"p"                 'proportional
54 KEY 158,CHR$(7)+"11"+CHR$(13)+CHR$(228)+CHR$(233)+
   CHR$(7)+"4"+CHR$(13)+CHR$(233)+CHR$(219)+CHR$(25)+
   CHR$(21)+CHR$(237)+">pl 10"+CHR$(13)+">tm 0"+CHR$
   (13)+">mm 20"+CHR$(25)+CHR$(219)+CHR$(11)+CHR$
   (25)+CHR$(252)  'Isolate address for envelope.
100 KEY DEF 50,1,&72,&52,149            '"R" key def.
102 KEY 149,CHR$(11)+CHR$(0)+"9"+CHR$(27)+CHR$(233)+
   CHR$(251)+CHR$(233)+CHR$(0)+"9"+CHR$(16)+CHR$
   (234)+CHR$(11)+CHR$(236)   'Retrieve ruler line.
104 KEY DEF 15,1,128,151,150           'f0 key def.
106 KEY 151,CHR$(252)+"s"+CHR$(13)+CHR$(13)+CHR$(252)
   'Save and continue
108 KEY 150,CHR$(251)+CHR$(233)+CHR$(250)+CHR$(233)+
    CHR$(0)+"9"+CHR$(27)+CHR$(237)+CHR$(234)+CHR$
    (11)+CHR$(0)+"9"+CHR$(16)+CHR$(236)
    'Store ruler line.
110 BORDER 26:INK 0,26:INK 1,0:|P,"pr nec"  'Set the
    screen, load the printer driver
1000 RESTORE 1000   '1000 to 1180 selects drive B if
     loaded.
1010 ii=48896
1030 FOR I=0 TO 49
1040 READ a$:a=VAL(CHR$(38)+a$)
1060 POKE ii+I,a
1080 NEXT
1120 data 21,30,bf,cd,d4,bc,3e,ff,cd,1b
1130 data 00,21,31,bf,cd,d4,bc,c5,e5,3e
1140 data 00,32,32,bf,1e,01,16,01,cd,1b
1150 data 00,e1,c1,d0,1e,01,16,03,cd,1b
1160 data 00,d0,3e,01,32,32,bf,c9,81,87
1180 call &bf00:if peek(&bf32) then |b
1190 run"a:d2
```

D2

```
1 |P,"opt 24":|P ",&bf00:call &bf00:if peek(&bf32)
  then |b
20 |P,"ab":|P 00:call &bf00:if peek(&bf32) then |b
```

Jumbo Code (or) Elephants In Straw Hats

REM line 1190

By this time, the start-up program was getting too big. 2.6K in 47 lines of BASIC (what?) may not be much, but it was a couple of K off the size of *both Protext* files, as the program stays in the BASIC area after *Protext* is called, which is silly. All it had to do was fire up the KDS port and fix the keys, after which I wanted it to dis-

appear. Again, I'm no programmer, so it took me some thought to remember that running a BASIC program clears the previous program out of memory. So the solution is to have a big program that does most of the work, then runs a minimal program which gets rid of the big program, and calls *Protext*. The second program (d2) has to have the drive specified in line 1190 because in the meantime the CPC may have logged onto B.

I put the minimum into "d2". Ideally it should just say "1 |p", but there's a minor problem with external commands to *Protext*. Some seem to work even though you run another program before |P. Others, not. I haven't done a deep analysis of this, but the way it works out here is that I could load the printer driver in line 110 of "disc", but the configuring of *Protext* with "Opt 24", which suppresses the ruler line and turns off right justify, only works from "d2". Still, I get within 169 bytes of the maximum, which isn't bad. It definitely beats losing 2K.

REM lines 14 to 108

I'm very shy about showing anybody "disc" and "d2". I'm sure that "disc" must be a mess, very uneconomical, but it does work (he said defensively). The key definitions are useful on my NEC P2200. I've got a bunch of font changes there that suit the NEC. You could put in anything else that you were minded to, provided that you expand the "Tokens" area if you put in any really big definitions.

PROTEXT KEYS

¦Protext	Address	¦Era *.bak
15 cpi *Italic*	Tiny print condensed	Large
f7	f8	f9
¦Help	¦Tokens	Proportional
S/focus	Courier	OCR-B
12 cpi	10 cpi	supers
f4	f5	f6
Save/cont	Mode 2	Cat
enhanced	Souvenir	12 cpi/hs
<u>under</u>	**bold**	subs
f1	f2	f3
Store ruler		
Save/cont		
NLQ		User
f0		f.
C/R-	Retrieve ruler	

● *Protext* key map. Fig 3.1

Now the commercial

Get *Utopia* if you can. It needs a review of its own. "Disc" is much neater because *Utopia* assigns function keys simply. *Utopia* is really something else. You can use it without leaving *Protext*. Especially, it gives you an instant disc sector editor, which means you can unerase right away after you've been particularly silly. You also get to *look* at the directory tracks. You can grip the bytes. It's surprising how much friendlier the disc feels after that.

Utopia automatically assigns various operations to the function keys, but you can alter them at will. I have kept "Cat" and "|Era *.bak" because life would be silly without them, "|Tokens" and "|Help" because both are useful at odd moments, and "|Protext" because it felt wrong to deny Motherhood... If I was serious, and I was into machine code (Aarrrgh!) I would *of course* have kept the call to *Maxam*. But I'm not, and I didn't.

I have printed out my function key definitions, and those for Brainstorm keys, on a disc-drive shaped piece of paper, and tacked it onto the Amdrive that sits on top of the built-in drive (the Amdrive was beautifully short and cheap). It hides the key and colour numbers, but you only need those for BASIC (what?) programming.

What is to be Done (or) Driving a Hard Printer

None of this is any use unless you get sweatily involved with your printer driver. After all, the whole object of the exercise is to get the stuff onto paper.

I'm told that people are put off by printer drivers. Well, okay, but in *Protext* especially they are very simple. In fact, Printer Drivers are Next to Godliness.

The first thing is to decide what you want to do. Printer manuals can be rather terse, but if you browse through the manual you're bound to find things you'd like to do. The next step is to do them. The manual may list a BASIC (what?) program to drive the printer. Forget it. It's a hundred times easier from *Protext*.

You can use any letter to send any set of codes. The choice is arbitrary, and it's yours. And you don't have to build it into the function keys. That's just more awkward at this stage. The normal *Protext* way of Ctrl/x + "letter" is much simpler when you're trying things out.

For Example

Here's an example; in line 42 of "disc", I've used "v" to set the 12 character per inch high speed mode of the NEC (it's supposed to go at 168 characters per second, and it does shift quite fast). As you can see, I've assigned it to Shift/f3, so I don't now have to remember the *Protext* printer code I've used. Suppose you wanted to enter this code. You look it up in the printer manual. The characters to send to the printer are: 27 77 28 83 1. In command mode, enter "setprint" or "sp". You go through the option to "Set print options" by entering "n" for "no", and say "y" at "change control codes". Then tell it you want to define "v". You type just those characters, with spaces, and finally closed by <<return>>. When setprint asks you for a code for "off", in this case you enter 28 83 0 <<return>>. Then save the printer driver. And that's all there is to it. I only chose this example to emphasise that it's possible to enter quite a few characters and have it work. Most printer control codes are in fact simpler, and have fewer numbers in them.

I apologise if this is a bit simple, but printer drivers did intimidate me a little to start with, and it would have been nice to have avuncular advice at the time. The thing is *not* to try to get it right all at once. Start from the Epson default driver that comes with *Protext*. Just replace some of the existing codes with your own, and save it with a short name you'll remember (how about NEC? Suits me...) Then load it into *Protext* by going "pr nec". If you want to find your drivers with CAT, they have the extension ".BIN", as in "nec.bin". It is pretty useful to keep some record of what you've done.

Different strokes

If your printer is very different (like the Juki) then look up the basic things you want to do, like underline and double strike, in the manual, and then put them into a printer driver (under, say "u" and "d") that you update gradually. It doesn't matter if you leave a lot of unwanted codes in the driver. Unless you call them up, they'll not do anything. The only one that gets used every time you print is the "@" code, which resets the printer each time you PRINT from *Protext*. This makes sure the printer is in a virginal state before you inject your new text. No nasty hold-overs from the previous file, like still being in condensed mode. The Epson reset code is 27 64. If your printer is different, it's a good idea to change that one first.

If you want to try something out, use ">oc" stored commands to send trial codes from a file, and observe the result. Sometimes it's much funnier than you thought, but mostly it works... It doesn't matter how many printer drivers you write. They're only small files. And you can have fun putting umlauts on things, or printing Danish "o"s by defining a code to go back and overprint the previous character (this backspace is almost always 8). I gave examples of these in the first *PwP*, for printing French accents.

Fun fun fun (till her Daddy took her *Protext* away)

After helping to build printer drivers for other programs, I honestly think that AMSDOS *Protext* is the easiest program to match to a printer that there is. It's so simple that it makes you understand the process better, and removes the fear of flying.

Generally, the only rule is the oldest one (no, not that): "There are no rules". The plain vanilla *Protext* that comes on the ROM will work fine, but I infinitely prefer my own version. It doesn't mean that anybody else would like it, but what I've done might just start a few hares. What you do is up to you.

Play, and enjoy.

TYPE-INS

ADAM WARING's monthly selection of key-ticklers

WORM

● 6128 only

David Hooper from Plymouth has sent in this totally ridiculous program. Pointless, but fun. We loved it.

```
{EpAv} 10 REM WORM. By David Hooper.
{CxBn} 20 INK 0,0:INK 1,15:INK 2,9:BORDER 0:MODE
       1:PEN 2
{GlBo} 30 LOCATE 1,20:PRINT STRING$(240,CHR$(143));
{AjBm} 40 FOR h=0 TO 100:PLOT RND*640,RND*96,0:NEXT
{MtAp} 50 GRAPHICS PEN 1
{JwAp} 60 n=100:sp=4+RND*4
{OwAx} 70 SYMBOL 240,0,0,0,0,127,149,127,0
{JsBj} 80 SYMBOL 241,0,0,0,12,242,82,252,0
{EvBi} 90 SYMBOL 242,0,0,0,31,106,159,96,0
{KrAw} 100 SYMBOL 243,0,0,0,204,178,210,60,0
{BqBk} 110 SYMBOL 244,0,0,30,43,102,145,96,0
{PxAx} 120 SYMBOL 245,0,0,0,204,178,210,60,0
{LrAo} 130 k=240:TAG
{OpCi} 140 GOSUB 170:k=242:GOSUB 170:k=244:GOSUB
       170:k=242:GOSUB 170:k=240
{LlAx} 150 IF h>640 THEN h=-40:sp=4+RND*4
{GnAm} 160 GOTO 140
{JvCm} 170 MOVE h,110:PRINT " ";CHR$(k);
       CHR$(k+1);:h=h+SP:FOR b=0 TO n:NEXT b
{HrAn} 180 RETURN ●
```

VIRUS

Fear not, *Virus* isn't the infectious computer disease that other less robust computers catch. Instead, it's an intriging two-player game – full instructions are included in the program. From Colin Campbell, of Gosport.

```
{PwAn} 10 REM            VIRUS
{NrAv} 20 REM            By Colin Campbell
{JmBj} 30 REM ────────────
{FsCk} 34 REM To change colour of 1st players
       chips, enter - INK 3,(as req) in line 40
{OlCt} 35 REM To change colour of 2nd players
       chips, enter required number after INK 2,in
       line 40.
{IwBl} 40 INK 2,8:DIM b(6,6),a(6),d(7),e(6),
       f(7),g(6,6)
{EkAw} 50 MODE 1:PRINT TAB(15);"VIRUS"
{EkBu} 60 d(1)=360:d(2)=328:d(3)=296:d(4)=264:
       d(5)=232:d(6)=200:d(7)=168
{LuBx} 70 f(1)=136:f(2)=200:f(3)=264:f(4)=328:
       f(5)=392:f(6)=456:f(7)=520
{IxBv} 80 a(1)=144:a(2)=208:a(3)=272:a(4)=336:
       a(5)=400:a(6)=464
{AuBq} 90 e(1)=352:e(2)=320:e(3)=288:e(4)=256:
       e(5)=224:e(6)=192
{LrBs} 100 DATA 2,3,3,3,3,2,3,4,4,4,4,3,3,4,4,
       4,4,3,3,4,4,4,4,3
{JpBi} 110 DATA 3,4,4,4,4,3,2,3,3,3,3,2
{JkCn} 120 RESTORE 100:FOR t=1 TO 6:FOR r=1 TO
       6:READ j:g(t,r)=j:NEXT r:NEXT t
{FrBr} 130 FOR j=1 TO 6:FOR k=1 TO 6:b(j,k)=0:NEXT
       k:NEXT j
{PvBx} 140 j4=0:z=1:PRINT:PRINT"A game for 2
       players on a 6 X 6 board."
{BpBv} 150 j5=0:PRINT"In his turn each player
       introduces a    chip on:-"
{FwAx} 170 PRINT"   <1> An empty space, or"
{PmCj} 180 PRINT"   <2> A square contaminated with
       one or      more of his chips"
{PuBo} 200 PRINT"However, each square has a point
       when"
{PsBn} 210 PRINT"it mutates and infects adjacent
       squares."
{OsDs} 220 PRINT"Corner squares mutate when
       containing 2 chips, side squares containing
       3 chips  and central squares 4 chips. "
{OwDk} 260 PRINT"When mutation occurs the chips on
       the   mutating square will spread to
       adjacent squares."
{CsCl} 280 PRINT"Any enemy chips on the latter
       squares   become contaminated."
{OvEt} 310 PRINT"Should receiving squares attain
       mutationlevel then further contamination
       results Any player having no chips left at
       the end of the opponents turn loses."
{AqAq} 340 PRINT"                              "
{FiBo} 350 PRINT"      Press any key to continue."
{GiAx} 360 i$=INKEY$:IF i$="" THEN 360
{KnAk} 370 CLS
{ClAx} 380 PRINT"Input name of first player"
{KuBn} 390 INPUT"MAX 10 letters and press
       RETURN";p$
{LmAu} 400 IF LEN(p$)>10 THEN 380
{JjBi} 410 PRINT"Input name of second player"
{OjBl} 420 INPUT"MAX 10 letters and press
       RETURN";q$
{BsAv} 430 IF LEN(q$)>10 THEN 410
{ItBn} 440 PRINT:PRINT"Press any key to commence."
{ErBi} 450 i$=INKEY$:IF i$="" THEN 460
{FlAn} 460 CLS:TAG
{ErBp} 470 FOR t=1 TO 7:MOVE 136,d(t):DRAW
       520,d(t):NEXT t
{FuBo} 480 FOR t=1 TO 7:MOVE f(t),360:DRAW
       f(t),168:NEXT t
{DnBq} 490 t1=9:FOR t=1 TO 6:MOVE
(t1*16),384:a$=STR$(t)
{ElAt} 500 PRINT a$;:t1=t1+4:NEXT t
{EqBq} 510 t1=22:FOR t=1 TO 6:MOVE 96,(t1*16):
       a$=STR$(t)
{FjAs} 520 PRINT a$;:t1=t1-2:NEXT t
{PuAv} 530 MOVE 320,128:DRAW 544,128
{IuBn} 540 DRAW 544,48:DRAW 320,48:DRAW 320,128
{IoBj} 550 MOVE 16,64:PRINT"SELECT NUMBER";
{CjBm} 560 MOVE 16,48:PRINT"AND PRESS RETURN";
{LvAt} 570 MOVE 16,112:PRINT"            ";
{FkBi} 580 MOVE 16,112:PRINT p$;:GOSUB 1000
{JlBl} 590 IF b(c1,r1)>9 THEN GOSUB 2000 ELSE 610
{ElAl} 600 GOTO 570
{NuBl} 610 b(c1,r1)=b(c1,r1)+1:GRAPHICS PAPER 3
{PsBi} 620 MOVE a(c1),e(r1):a$=STR$(b(c1,r1))+" "
{PwAu} 630 PRINT a$;:GRAPHICS PAPER 0
{PiBi} 640 j1=0:FOR j=1 TO 6:FOR k=1 TO 6
{DvCr} 650 IF b(j,k)=g(j,k) OR (b(j,k)>g(j,k) AND
       b(j,k)<9) THEN GOSUB 3000 ELSE 730
{LjBo} 660 j1=1:k3=k:j3=j-1:IF j3>0 THEN GOSUB 4000
{KvAx} 670 j3=j+1:IF j3<7 THEN GOSUB 4000
{ClBk} 680 j3=j:k3=k-1:IF k3>0 THEN GOSUB 4000
{JkBi} 690 k3=k+1:IF k3<7 THEN GOSUB 4000
{MlBs} 700 FOR h=1 TO 6:FOR L=1 TO 6:IF b(h,L)>10
       THEN j5=1
{MjBj} 710 NEXT L:NEXT h:IF j5=0 THEN 750
{AiAm} 720 j5=0
{JqBs} 730 GRAPHICS PAPER 0:NEXT k:NEXT j:IF j1=1
       THEN 640
{GnAm} 740 GOTO 770
{AjAt} 750 IF z=1 THEN 720
{LiAm} 760 GOTO 950
{FqAk} 770 z=0
{InAt} 780 MOVE 16,112:PRINT"            ";
{EnAx} 790 MOVE 16,112:PRINT q$;:GOSUB 1000
{DoBt} 800 IF b(c1,r1)<10 AND b(c1,r1)>0 THEN GOSUB
       2000 ELSE 820
{NoAm} 810 GOTO 780
{ImAx} 820 IF b(c1,r1)=0 THEN b(c1,r1)=10
{NjBl} 830 b(c1,r1)=b(c1,r1)+1:GRAPHICS PAPER 2
{BwBx} 840 MOVE a(c1),e(r1):a$=STR$(b(c1,r1)-10)+"
       ":PRINT a$;:GRAPHICS PAPER 0
{JvBj} 850 j2=0:FOR j=1 TO 6:FOR k=1 TO 6
{ElCk} 860 IF b(j,k)-10=g(j,k) OR b(j,k)-10>g(j,k)
       THEN GOSUB 3000 ELSE 940
{PmBj} 870 j2=1:k3=k:j3=j-1:IF j3>0 THEN GOSUB 5000
{DpAw} 880 j3=j+1:IF j3<7 THEN GOSUB 5000
{AxBj} 890 j3=j:k3=k-1:IF k3>0 THEN GOSUB 5000
{PpAx} 900 k3=k+1:IF k3<7 THEN GOSUB 5000
{NsCj} 910 FOR h=1 TO 6:FOR L=1 TO 6:IF b(h,L)<9
       AND b(h,L)>0 THEN j4=1
{JjBj} 920 NEXT l:NEXT h:IF j4=0 THEN 950
{AoAm} 930 j4=0
{HrBx} 940 GRAPHICS PAPER 0:NEXT k:NEXT j:IF j2=1
       THEN 850 ELSE 570
{JpBs} 950 GRAPHICS PAPER 0:MOVE 16,96:PRINT"***
       WINS ***";
{OjBu} 960 MOVE 16,32:PRINT"HIT S (STOP), P (PLAY
AGAIN) and wait";:GOSUB 6000
{EnCj} 970 i$="":WHILE i$="":i$=INKEY$:WEND:IF
       i$="S" OR i$="s"THEN CLS: END
{AwBn} 980 IF i$="P" OR i$="p" THEN 990 ELSE 960
{KnBs} 990 TAGOFF:PAPER 0:PEN 1:MODE 1:INK
       2,6:CLS:RUN "VIRUS"
{KxAu} 1000 MOVE 352,96:PRINT"          ";
{PrAv} 1010 MOVE 352,64:PRINT"          ";
{FwAx} 1020 MOVE 353,96:PRINT"COLUMN";
{GuBk} 1030 i$="":WHILE i$="":i$=INKEY$:WEND
{DwBl} 1040 n$=INKEY$:IF n$<>CHR$(13) THEN 1040
{KuBm} 1050 c1=VAL(i$):IF c1<1 OR c1>6 THEN 1020
{ApAu} 1060 MOVE 480,96:PRINT i$;
```

```
{KmAw} 1070 MOVE 352,64:PRINT"ROW";
{EjBk} 1080 i$="":WHILE i$="":i$=INKEY$:WEND
{OqBk} 1090 n$=INKEY$:IF n$<>CHR$(13) THEN 1090
{FvBo} 1100 r1=VAL(i$):IF r1<1 OR r1>6 THEN 1070
{JpBi} 1110 MOVE 480,64:PRINT i$;:RETURN
{FvAx} 2000 MOVE 352,96:PRINT"ILLEGAL    ";
{KkAx} 2010 MOVE 352,64:PRINT"MOVE       ";
{JkAu} 2020 FOR t=1 TO 2000:NEXT t
{ElAw} 2030 MOVE 352,96:PRINT"           ";
{MrBk} 2040 MOVE 352,64:PRINT"           ";:RETURN
{MiAp} 3000 FOR d=1 TO 4
{JjCl} 3010 IF b(j,k)>9 THEN a$=STR$(b(j,k)-10)+" "
       ELSE a$=STR$(b(j,k))+" "
{KoAw} 3020 MOVE a(j),e(k):PRINT a$;
{JjBm} 3030 FOR d1=1 TO 500:NEXT d1:MOVE a(j),e(k)
{IvCs} 3040 PRINT"   ";:ENV 1,10,1,100:SOUND
       1,30,50,12,1:FOR d1=1 TO 500:NEXT d1:NEXT d
{OrBq} 3050 b(j,k)=b(j,k)-g(j,k):IF b(j,k)=10 THEN
       b(j,k)=0
{IuAw} 3060 IF b(j,k)<1 THEN 3120
{DlAx} 3070 IF b(j,k)>5 THEN 3100
{PtCk} 3080 GRAPHICS PAPER 3:a$=STR$(b(j,k))+" ":
       MOVE a(j),e(k):PRINT a$;
{PlAx} 3090 GRAPHICS PAPER 0:GOTO 3120
{NnCo} 3100 GRAPHICS PAPER 2:a$=STR$(b(j,k)-10)
       +" ":MOVE a(j),e(k):PRINT a$;
{DsAs} 3110 GRAPHICS PAPER 0
{DrAo} 3120 RETURN
{PwCn} 4000 IF b(j3,k3)>9 THEN b(j3,k3)=b(j3,k3)-9
ELSE b(j3,k3)=b(j3,k3)+1
{EwAw} 4010 MOVE a(j3),e(k3):PRINT"   ";
{IlBo} 4020 GRAPHICS PAPER 3:a$=STR$(b(j3,k3))+" "
{NxBi} 4030 MOVE a(j3),e(k3):PRINT a$;:RETURN
{NtCn} 5000 IF b(j3,k3)<9 THEN b(j3,k3)=b(j3,k3)+11
ELSE b(j3,k3)=b(j3,k3)+1
{KxAv} 5010 MOVE a(j3),e(k3):PRINT"   ";
{AsBq} 5020 GRAPHICS PAPER 2:a$=STR$(b(j3,k3)-10)
       +" "
{KiBi} 5030 MOVE a(j3),e(k3):PRINT a$;:RETURN
{BiAr} 6000 FOR octave=-1 TO 2
{NkBj} 6010 FOR x=1 TO 25: REM notes per octave
{KjAo} 6020 READ note
{LvAt} 6030 SOUND 1,note/2^octave
{BpAl} 6040 NEXT
{MiAn} 6050 RESTORE
{BrAk} 6060 NEXT
{DrDq} 6070 DATA 426,379,358,319,284,253,239,253,
       284,319,358,379,426,379,358,319,284,253,239,
       253,284,319,358,379,426
{BoAo} 6080 RETURN ●
```

SWTEXT

Those kind people at Swift Software have written a text editor – ideal for creating *Pandora* listings. Note that you MUST save the program before running it, as you can't get back to BASIC once run. Press CONTROL H for operating instructions.

```
{GkBs} 100 REM ******************************
{HqAp} 110 REM *                            *
{DjAx} 120 REM *  Swift Text Editor  v1.00  *
{JuAp} 130 REM *                            *
{NmBi} 140 REM * (c) 1989 Swift Innovations *
{MiAo} 150 REM *                            *
{MwBs} 160 REM ******************************
{DiAl} 170 REM
{OxBs} 180 MODE 2:INK 0,3:INK 1,26:BORDER 0:ON
       ERROR GOTO 1440
{CuCn} 190 POKE &BDEE,&C9:KEY DEF 66,0,6,0,0:DEFINT
       a-z:DIM a$(501):GOSUB 1480
{LxBo} 200 x=1:y=1:s=1:c=1:t=1:j=1:q=24:p=25:GOTO
       890
{NmAn} 210 GOSUB 710
{AvBr} 220 t$=a$(c):IF x>(LEN(t$)+1) THEN
       x=LEN(t$)+1
{LpAt} 230 IF c>t THEN t=c
{JvAs} 240 r=0:GOSUB 340:a$(c)=t$
{BkCn} 250 IF m=0 THEN 220 ELSE IF m=-1 THEN 300
       ELSE IF m=99 THEN 890
{HlBr} 260 IF c<500 THEN c=c+1 ELSE PRINT
       CHR$(7);:GOTO 220
{CvBw} 270 IF c>t AND i$=CHR$(241) THEN c=c-1:PRINT
       CHR$(7);:GOTO 220
{AqAv} 280 y=y+1:IF y<26 THEN 220
{PnCj} 290 s=s+1:y=p:LOCATE 79,25:PRINT:PRINT:
       LOCATE 1,y:PRINT a$(c);:GOTO 220
{AtBk} 300 IF c=1 THEN PRINT CHR$(7);:GOTO 220
{PoBo} 310 c=c-1:IF c<1 THEN c=1:PRINT
       CHR$(7);:GOTO 220
{JrAu} 320 y=y-1:IF y>0 THEN 220
{LqCj} 330 s=s-1:y=1:LOCATE 1,1:PRINT
       CHR$(11):LOCATE 1,y:PRINT a$(c);:GOTO 220
{EsBr} 340 LOCATE x,y:PRINT
       CHR$(143);:i$=INKEY$:LOCATE x,y
{MnBx} 350 IF MID$(t$,x,1)<" " THEN PRINT " "; ELSE
       PRINT MID$(t$,x,1);
{BuAs} 360 IF i$="" THEN 340
{FkBm} 370 IF i$=CHR$(242) THEN GOSUB 580:GOTO 340
{ArBm} 380 IF i$=CHR$(243) THEN GOSUB 600:GOTO 340
{OoBl} 390 IF i$=CHR$(240) THEN m=-1:g=s:RETURN
{ArBl} 400 IF i$=CHR$(241) THEN m=1:g=s:RETURN
{EoBs} 410 IF i$=CHR$(13) THEN GOSUB
       1570:m=1:x=1:g=s:RETURN
{CuBi} 420 IF i$=CHR$(127) THEN GOTO 620
{OwBl} 430 IF i$=CHR$(16) THEN GOSUB 680:GOTO 340
{DmBk} 440 IF i$=CHR$(250) THEN x=1:GOTO 340
{BiBp} 450 IF i$=CHR$(251) THEN x=LEN(t$)+1:GOTO
       340
{OwBl} 460 IF i$=CHR$(14) THEN GOSUB 780:GOTO 340
{IwAu} 470 IF i$=CHR$(248) THEN 800
{GpAw} 480 IF i$=CHR$(249) THEN 820
{NsBl} 490 IF i$=CHR$(4) THEN GOSUB 850:GOTO 340
{MjAu} 500 IF i$=CHR$(27) THEN 870
{LuAu} 510 IF i$=CHR$(29) THEN 880
{NsBk} 520 IF i$=CHR$(6) THEN m=99:RETURN
{KuBn} 530 IF i$=CHR$(8) THEN GOSUB 1240:GOTO 340
{NiAv} 540 IF i$<CHR$(32) THEN 340
{MpBm} 550 IF LEN(t$)>78 THEN PRINT CHR$(7);:GOTO
       340
{DrCq} 560 IF LEN(t$)>=x THEN t$=LEFT$(t$,x-1)
       +i$+RIGHT$(t$,LEN(t$)-x+1) ELSE t$=t$+i$
{CwBu} 570 LOCATE x,y:PRINT RIGHT$(t$,LEN(t$)-x+1)
       ;:x=x+1:GOTO 340
{GmAs} 580 IF x>1 THEN x=x-1
{LlAm} 590 RETURN
{MuBk} 600 IF x<=LEN(t$) AND x<80 THEN x=x+1
{GnAn} 610 RETURN
{FtAr} 620 IF x>1 THEN 660
{JqCl} 630 IF (LEN(a$(c-1))+LEN(t$)) > 79 OR c=1
       THEN PRINT CHR$(7);:RETURN
{ArBo} 640 x=LEN(a$(c-1))+1:a$(c-1)=a$
       (c-1)+t$:g=999
{LnBx} 650 FOR j=c TO t:a$(j)=a$(j+1):NEXT:t=t-1
       :m=-1:t$=a$(c):GOTO 710
{ExBx} 660 t$=LEFT$(t$,x-2)+RIGHT$(t$,LEN(t$)
       -x+1):x=x-1:LOCATE x,y
{KvBp} 670 PRINT RIGHT$(t$,LEN(t$)-x+1);" ";:GOTO
       340
{GmAw} 680 IF x>LEN(t$) THEN RETURN
{MrBr} 690 t$=LEFT$(t$,x-1)+RIGHT$(t$,LEN(t$)-x)
       :LOCATE x,y
{OmBn} 700 PRINT RIGHT$(t$,LEN(t$)-x+1);" ";:RETURN
{JvBo} 710 LOCATE 1,1:IF s<1 THEN s=1:y=c:GOTO 740
{EvAx} 720 IF s>476 THEN s=t-q:y=c-s+1
{IlAv} 730 IF g=s THEN RETURN
{AxBq} 740 FOR j=s TO s+q:PRINT
       a$(j);CHR$(18):NEXT:RETURN
{PuAx} 750 IF s<1 THEN s=1:y=1:GOTO 770
{CvAx} 760 IF s>476 THEN s=t-q:y=c-s+1
{BqCk} 770 z=c:LOCATE 1,y:FOR j=y TO 25:PRINT
       a$(z);CHR$(18):z=z+1:NEXT:RETURN
{FmBj} 780 IF t=500 THEN PRINT CHR$(7);:RETURN
{AwCl} 790 FOR j=t TO c STEP-1:
       a$(j+1)=a$(j):NEXT:t$="":a$(c)="":x=1:
       t=t+1:GOTO 750
{JtAs} 800 m=0:IF c<26 THEN 870
{ApBn} 810 g=s:a$(c)=t$:c=c-p:s=s-p:t$=a$(c):GOTO
       710
{HoCj} 820 m=0:IF t<26 THEN PRINT CHR$(7);:RETURN
       ELSE IF c+p>t THEN 880
{KnBx} 830 g=s:a$(c)=t$:c=c+p:s=s+p:t$=a$(c):
       IF t-c<p THEN s=t-q:y=p-(t-c)
{ArAn} 840 GOTO 710
{GwBj} 850 IF c=t THEN PRINT CHR$(7);:RETURN
{ItBx} 860 FOR j=c TO t:a$(j)=a$(j+1):
       NEXT:t$=a$(c):x=1:t=t-1:GOTO 750
{AjBq} 870 g=s:a$(c)=t$:c=1:s=1:x=1:y=1:t$=a$(c):
       m=0:GOTO 710
{AkBt} 880 g=s:a$(c)=t$:c=t:s=t-
       q:x=1:y=p:t$=a$(c):m=0:GOTO 710
{OoBn} 890 GOSUB 1460:LOCATE 16,7:PRINT "MAIN MENU"
{CwBk} 900 LOCATE 14,10:PRINT "L   Load File"
{GiAw} 910 LOCATE 14,11:PRINT "S   Save File"
{OmBk} 920 LOCATE 14,12:PRINT "P   Print File"
{PsBi} 930 LOCATE 14,13:PRINT "C   Catalogue"
{OjBj} 940 LOCATE 14,14:PRINT "W   Wipe Text"
{LxAx} 950 LOCATE 14,15:PRINT "Q   Quit to Basic"
{HlBk} 960 LOCATE 14,16:PRINT "ESC Edit File"
{PkBq} 970 LOCATE 7,19:PRINT "Please enter your
       selection"
{JvBv} 980 LOCATE 2,24:PRINT "For help while
       editing press CONTROL-H"
{HkAu} 990 dummy$=HEX$(FRE(a$))
{FtBq} 1000 i$=INKEY$:IF i$="" THEN 1000 ELSE
       i$=UPPER$(i$)
{BoAv} 1010 IF i$="L" THEN 1090
{LvAu} 1020 IF i$="S" THEN 1140
{LlAu} 1030 IF i$="W" THEN 1170
{HmBo} 1040 IF i$=CHR$(6) THEN MODE 2:g=999:GOTO
       210
{KtAs} 1050 IF i$="P" THEN 1220
{MvAt} 1060 IF i$="C" THEN 1420
{GjAv} 1070 IF i$="Q" THEN 1530
{JqAm} 1080 GOTO 1000
{DkBp} 1090 GOSUB 1460:LOCATE 17,10:PRINT "Load
       File"
{EmBp} 1100 LOCATE 3,14:INPUT "Enter Filename: ",f$
{FwBu} 1110 FOR j=1 TO t:a$(j)="":NEXT:j=1:x=1:y=1:
       s=1:c=1:t=1:OPENIN f$
{DxCr} 1120 WHILE NOT EOF:LINE INPUT #9,a$(j):
       a$(j)=LEFT$(a$(j),79):j=j+1:GOTO 1120
{AnBk} 1130 WEND:CLOSEIN:t=j:x=1:y=1:s=1:GOTO 890
{EuBp} 1140 GOSUB 1460:LOCATE 17,10:PRINT "Save
       File"
{PlBo} 1150 LOCATE 3,14:INPUT "Enter Filename: ",f$
{AjCl} 1160 OPENOUT f$:FOR j=1 TO t:PRINT
       #9,a$(j):NEXT:CLOSEOUT:GOTO 890
{KoBn} 1170 GOSUB 1460:LOCATE 17,10:PRINT "Wipe
       Text"
```

```
{FpBl} 1180 LOCATE 11,14:PRINT "Are you sure?
       (Y/N)"
{BnBt} 1190 ik$=INKEY$:IF ik$="" THEN 1190 ELSE
       ik$=UPPER$(ik$)
{AsAv} 1200 IF ik$<>"Y" THEN 890
{KrBq} 1210 FOR j=1 TO t:a$(j)="":NEXT:t=1:x=1:y=1:
       s=1:GOTO 890
{AnBp} 1220 GOSUB 1460:LOCATE 15,12:PRINT "Printing
       File"
{MiCj} 1230 FOR j=1 TO t:PRINT #8,a$(j):NEXT:PRINT
       #8,CHR$(12):GOTO 890
{FqAo} 1240 GOSUB 1460
{PpBp} 1250 LOCATE 5,4:PRINT "CONTROL D - Delete
       Line"
{JrBl} 1260 LOCATE 5,5:PRINT "CONTROL H - Help"
{DrBr} 1270 LOCATE 5,6:PRINT "CONTROL N - Insert
       New Line"
{EtBu} 1280 LOCATE 5,8:PRINT "CLR";SPC(7);"- Delete
       Char on Right"
{OjBt} 1290 LOCATE 5,9:PRINT "DEL";SPC(7);"- Delete
       Char on Left"
{IvBx} 1300 LOCATE 5,10:PRINT "RETURN";SPC(4);"-
       Start of Next Line"
{FmBr} 1310 LOCATE 5,12:PRINT "CONTROL [ - Start of
       Text"
{OuBq} 1320 LOCATE 5,13:PRINT "CONTROL ] - End of
       Text"
{DxBw} 1330 LOCATE 5,15:PRINT "CONTROL ";
       CHR$(240);" - Up a Screen"
{IxCi} 1340 LOCATE 5,16:PRINT "CONTROL ";
       CHR$(241);" - Down a Screen"
{JsBw} 1350 LOCATE 5,17:PRINT "CONTROL ";
       CHR$(242);" - Start of Line"
{CpBv} 1360 LOCATE 5,18:PRINT "CONTROL ";
       CHR$(243);" - End of Line"
{IsBn} 1370 LOCATE 5,20:PRINT "ESC";SPC(7);"- Main
       Menu"
{PmBu} 1380 LOCATE 5,22:PRINT "Use ";CHR$(240);" ";
       CHR$(241);" ";
{LkBt} 1390 PRINT CHR$(242);" & ";CHR$(243);" to
       move the cursor"
{NtBv} 1400 LOCATE 5,24:PRINT "Press a key to
       return to editing"
{DqBl} 1410 CALL &BB18:MODE 2:g=999:GOTO 710
{AmCo} 1420 MODE 2:CAT:LOCATE 21,24:PRINT "Press
       any key to return to the main menu"
{NnAs} 1430 CALL &BB18:GOTO 890
{DvBs} 1440 LOCATE 8,24:PRINT "Press any key to
       continue"
{OiAt} 1450 CALL &BB18:RESUME 890
{JuBx} 1460 MODE 1:MOVE 0,0:DRAW 638,0:DRAW
       638,398:DRAW 0,398:DRAW 0,0
{AwBr} 1470 LOCATE 9,2:PRINT "SWIFT TEXT EDITOR
       v1.00":RETURN
{KkBr} 1480 z$="f55d54cd1abc78c1fe0178ebc20000
       cda5bbcd06b9"
```


```
{DkBm} 1490 z$=z$+"01ff073e08eda00ceb09eb3d20f7c9"
{NjCk} 1500 CALL &BB51:FOR n=0 TO 35:POKE
       n+&BE80,VAL("&"+MID$(z$,n*2+1,2)):NEXT
{HqCj} 1510 POKE &BE8D,PEEK(&BDD4):POKE
       &BE8E,PEEK(&BDD5):POKE &BDD3,195
{FjBo} 1520 POKE &BDD4,&80:POKE &BDD5,&BE:RETURN
{EjBl} 1530 GOSUB 1460:LOCATE 19,10:PRINT "Quit"
{DlBl} 1540 LOCATE 11,14:PRINT "Are you sure?
       (Y/N)"
{OiAt} 1450 CALL &BB18:RESUME 890
{JuBx} 1460 MODE 1:MOVE 0,0:DRAW 638,0:DRAW
       638,398:DRAW 0,398:DRAW 0,0
{AwBr} 1470 LOCATE 9,2:PRINT "SWIFT TEXT EDITOR
       v1.00":RETURN
{KkBr} 1480 z$="f55d54cd1abc78c1fe0178ebc20000
```


```
       cda5bbcd06b9"
{DkBm} 1490 z$=z$+"01ff073e08eda00ceb09eb3d20f7c9"
{NjCk} 1500 CALL &BB51:FOR n=0 TO 35:POKE
       n+&BE80,VAL("&"+MID$(z$,n*2+1,2)):NEXT
{HqCj} 1510 POKE &BE8D,PEEK(&BDD4):POKE
       &BE8E,PEEK(&BDD5):POKE &BDD3,195
{FjBo} 1520 POKE &BDD4,&80:POKE &BDD5,&BE:RETURN
{EjBl} 1530 GOSUB 1460:LOCATE 19,10:PRINT "Quit"
{DlBl} 1540 LOCATE 11,14:PRINT "Are you sure?
       (Y/N)"
{NvBt} 1550 ik$=INKEY$:IF ik$="" THEN 1550 ELSE
       ik$=UPPER$(ik$)
{GnBj} 1560 IF ik$<>"Y" THEN 890 ELSE CALL 0
{GnBk} 1570 IF t=500 THEN PRINT CHR$(7);:RETURN
{OlBq} 1580 FOR j=t TO c+1 STEP -1:
       a$(j+1)=a$(j):NEXT:t=t+1
{JlCn} 1590 a$(c+1)=RIGHT$(t$,LEN(t$)-x+1):a$(c)
       =LEFT$(t$,x-1):t$=a$(c):g=999:GOTO 710 ●
```

RSX STRINGS

● 464 only

Dominic Wise of Cambridge contributes this excellent utility for 464 owners. The program allows strings to be passed to RSXs or CALL statements, and is of particular use to disk drive owners. Commands such as |REN,"file1","file2" will now work with the utility installed.

```
{EwAl} 10 MODE 1
{NkCj} 20 INPUT"Assemble to &BEC0 ?",a$:IF
       UPPER$(a$)="Y" THEN st=&BEC0:GOTO 40
{OuCk} 30 INPUT "Assembly address ?",a$:
       st=VAL(a$):IF st<=HIMEM THEN MEMORY st-1
{MqAq} 40 FOR n=0 TO 6:t=0
{CvCj} 50 FOR m=0 TO 8:READ a$:x=VAL("&"+a$):t=t+x:
       POKE st+d,x:d=d+1:NEXT
{DrCv} 60 READ a$:IF VAL("&"+a$)=t THEN NEXT ELSE
       PRINT"Error in line ";10*n+70:PRINT
       HEX$(t,3):STOP
{GrBr} 70 FOR n=0 TO 2:POKE
       st+26+n,PEEK(&AC04+n):NEXT
{EiCr} 80 CALL st+39,st:CLS:PRINT"RSX strings
       utility installed at &";HEX$(st,4);".":PRINT
{PnBl} 90 DATA 7b,fe,0d,20,14,e1,d1,d5,e5,526
{PlBi} 100 DATA 21,3b,01,19,20,0a,3e,02,32,112
{KtBj} 110 DATA c1,b0,e1,2a,c2,b0,37,5f,c9,54d
{NwBj} 120 DATA c9,c9,21,9c,b0,22,9a,b0,b7,522
{NnBj} 130 DATA 08,d9,c9,3e,c3,32,04,ac,eb,478
{MuBj} 140 DATA 22,05,ac,3e,cd,32,ac,b9,11,386
{LtAw} 150 DATA 1d,00,19,22,ad,b9,c9,00,00,287 ●
```

SEARCH

This small but useful BASIC program comes from G Rowles of Dartford. The program will search for a string embedded in an ASCII file, and inform you where, and how many times, the string occurs. Essential for bug-hunting in those long listings.

```
{IxAl} 10 MODE 2
{JnBx} 20 LINE INPUT"What is the file name (or just
       press return) ?":fln$
{EnBx} 30 LINE INPUT"What is the text you are
       looking for ? ";t$:t$=UPPER$(t$)
{JuCn} 40 PRINT"Press PLAY then any key: ";
       CHR$(143):WHILE INKEY$="":WEND:MODE 2
{HmAn} 50 OPENIN"!"+fln$
{PmAr} 60 WHILE NOT EOF:s=0
{FoAw} 70 LINE INPUT#9,a$:a$=UPPER$(a$)
{PoAq} 80 li.num=VAL(a$)
{MpAk} 90 y=1
{GsBx} 100 IF INSTR(y,a$,t$)THEN
       s=s+1:y=INSTR(y,a$,t$)+(LEN(t$)-1)
{IwBi} 110 y=y+1:IF y<LEN(a$)-1 THEN 100
{OpBt} 120 IF s<>0 THEN PRINT"There's";s;"in
       line";li.num:s=0
{MiAk} 130 WEND
{NvAt} 140 PRINT:PRINT:PRINT:END ●
```

RETRIEVER

Paul Askey of Tavistock, Devon, could be the saviour of many tape users when they find that they can't load their precious programs because of load errors. His special utility loads in all of the program it can, ignoring the errors and minimising the amount that has to be re-typed.

After running Paul's program the message "Searching for file..." will be displayed. Insert the tape containing the corrupted BASIC program into the cassette recorder and press Play. Once the program has been found you'll be asked which block to load in. Wind the tape to the start of the block and the computer will load in as much as possible, displaying the percentage of success as a bar graph.

When all blocks have been loaded in then it's time to try to save the program. Firstly a list of line numbers are displayed. Note any odd-looking numbers – this is so that the computer can delete any bad lines before saving. Now insert your fresh tape and the program will be re-saved ready for editing.

```
{FqAx} 10 MODE 1:PAPER 0:PEN 1:BORDER 0
{KiBi} 20 INK 2,7:INK 3,14:INK 1,26:INK 0,0
{HjAx} 30 SPEED WRITE 1:SPEED KEY 7,1
{NkBi} 35 IF PEEK(&BE00)=1 THEN 40
{BwBi} 36 PRINT"Please wait..":GOSUB 2000
{InAv} 40 PRINT"Searching for file.."
{KlAr} 50 GOSUB 1300:name$=file$
{ArAu} 100 PRINT"Found "name$" block "b
{DkAs} 140 PRINT"Accept (Y/N)":a$=""
{AiBk} 145 WHILE a$="":a$=LOWER$(INKEY$):WEND
{CuAt} 150 IF a$="n" THEN RUN
{NsBj} 155 PRINT:PRINT"Rewind tape a bit."
{HpAr} 160 type=PEEK(&ABD2)
{PjBk} 170 loc=PEEK(&ABD5)+256*PEEK(&ABD6)
{FrBn} 180 length=PEEK(&ABD8)+256*PEEK(&ABD9)
{AmAx} 190 block=INT(length/&800)
{FxBj} 200 IF length=block*&800 THEN 222
{BoAp} 210 block=block+1
{EmBi} 222 CALL &BE16  'Clear workspace
{OoAu} 260 ' Set up file variables
{OqAp} 270 DIM a(block,2)
{BvAr} 280 FOR n=1 TO block
{CkAu} 290 a(n,1)=2048:a(n,2)=0
```

```
{MrBr} 300 IF n=block THEN a(n,1)=length-
       block*&800+&800
{EmAl} 310 NEXT
{PxAm} 320 ' MAIN LOOP
{MrAn} 330 MODE 1:CLG 3
{JlAw} 340 WINDOW 31,39,2,24:PAPER 2
{FmAv} 350 CLS:PRINT"Loaded : "
{OwAr} 360 FOR n=1 TO block
{JxAq} 370 PRINT USING"##";n
{LvAr} 380 PLOT 528,366-n*16,1
{MmAs} 390 DRAWR 84,0:DRAWR 0,-12
{IoAs} 400 DRAWR -84,0:DRAWR 0,12
{IsAn} 410 NEXT:PAPER 0
{HxAu} 420 ' Display % of block loaded
{NoAq} 430 FOR n=1 TO block
{OiAv} 440 percent=a(n,2)/a(n,1)*80
{HuBk} 450 FOR h=364-n*16 TO 356-n*16 STEP-2
{PnAx} 460 MOVE 530,h:DRAWR percent,0,1
{BjBk} 470 IF percent<80 THEN DRAW 610,h,0
{FlAm} 480 NEXT h,n
{HnAj} 510 :
{ExAs} 520 WINDOW 1,29,1,25:CLS
{KiBk} 530 LOCATE 1,4:PRINT"  OPTIONS :"CHR$(10)
{HuBj} 540 a$=CHR$(10)+"  "+CHR$(15)+CHR$(2)
{CvAt} 550 b$=CHR$(15)+CHR$(3)+"  "
{AtBk} 560 PRINT a$;"1";b$;"Load a block."
{AxBl} 570 PRINT a$;"2";b$;"Create & save BASIC
       file"
{KiAp} 590 PRINT:PEN 1
{CwAt} 600 PRINT"  Enter choice "
{IwBo} 605 a$=INKEY$:IF a$<"1" OR a$>"2" THEN 605
{BmAr} 610 a=VAL(a$):PRINT
{LnAu} 620 ON a GOSUB 640,1000:GOTO 420
{CrAo} 640 'Load a block
{PoAs} 650 INPUT"Load block no.",a
{KoAx} 660 IF a>block OR a=0 THEN 650
{OoAm} 750 GOSUB 1300
{CmAu} 790 IF file$=name$ THEN 820
{FsAv} 800 PRINT"Found "file$" block"b
{CwAn} 810 GOTO 750
{LpAr} 820 IF b<>a THEN 800
{CnAx} 830 PRINT"Loading "file$" block"b
{EoAp} 840 CALL &BE24
{FnBk} 850 PRINT:PRINT"Block length"a(b,1)
{EuAu} 880 c=PEEK(0)+256*PEEK(1)
{FvAx} 890 IF c>a(b,1) THEN c=a(b,1)
{ItAv} 900 PRINT"Bytes loaded"c
{HoAu} 910 IF c>a(a,2) THEN 930
{GiAv} 920 FOR n=1 TO 1500:NEXT:RETURN
{KtAu} 930 PRINT"Inserting block"a
{NtAp} 940 ad=&1800+a*&800
{BjAu} 950 FOR n=&A380 TO &A380+c
{ArBi} 960 POKE ad,PEEK(n):ad=ad+1:NEXT
{GjAr} 970 a(a,2)=c:RETURN
{LjAu} 1000 'Create and save BASIC file
{IoAu} 1020 FOR n=1 TO LEN(name$)
{ExBl} 1030 POKE &BF33+n,ASC(MID$(name$,n,1))
{IrAq} 1040 NEXT:CALL &BE43
{OkAl} 1050 ad=&2000
{ErBk} 1060 PRINT"Please note any line numbers"
{InBk} 1070 PRINT"which appear  to  be  out of"
{GwAp} 1071 PRINT"place."
{KjAt} 1075 FOR n=1 TO 1500:NEXT
{JnAm} 1080 ad=&2000
{NtBk} 1090 IF PEEK(ad)+PEEK(ad+1)=0 THEN 1130
{PmBq} 1100 PRINT USING"Line    ##### ";
       PEEK(ad+2)+256*PEEK(ad+3)
{MpAp} 1110 ad=ad+PEEK(ad)
{AjAo} 1120 GOTO 1090
{IwBm} 1130 PRINT"Were there any bad line
       numbers ?"
{BvBu} 1140 a=0:WHILE a<2:a=INSTR("
       yn",LOWER$(INKEY$)):WEND
{KqAr} 1150 IF a=3 THEN 1185
{NoAv} 1160 INPUT"Which line number ";a
{CqAr} 1170 CALL &BEF1,a
{IiAw} 1180 PRINT"Any more ?":GOTO 1140
{KjBo} 1185 PRINT"Press REC and PLAY then any
       key: è";
{KwBm} 1186 CALL &BB18:PRINT CHR$(8)CHR$(32)
{IxAp} 1190 CALL &BE83
{DvAo} 1200 RETURN
{HiAr} 1300 'Load a file header
{HuAp} 1310 CALL &BE00
{PjAw} 1320 b=PEEK(&ABD0):file$=""
{PtAs} 1330 FOR n=&ABC0 TO &ABCF
{MrBi} 1340 file$=file$+CHR$(PEEK(n)):NEXT
{DkAo} 1350 RETURN
{NsAo} 2000 'Machine code
{GuAv} 2010 MEMORY &1FFF:DEFINT a-z
{GxAt} 2020 ln=2140:RESTORE 2000
{AiAu} 2030 FOR n=&BE00 TO &BF4D STEP 9
{KoAm} 2040 ch=0
{FvAp} 2050 FOR h=n TO n+8
{MkAu} 2060 READ a$:a=VAL("&"+a$)
{HrAs} 2070 ch=ch+a:POKE h,a
{FxAm} 2080 NEXT h
{AuBm} 2090 READ ch$:IF VAL("&"+ch$)=ch THEN 2110
{PiBi} 2100 PRINT"Line"ln"check &"HEX$(ch),
{PuAs} 2110 ln=ln+10:NEXT n
{BnAo} 2120 RETURN
{AtAk} 2130 :
{DtBl} 2140 DATA 01,10,b6,ed,49,21,c0,ab,11,39a
{OkBj} 2150 DATA 40,00,3e,2c,cd,a1,bc,01,00,2d5
{DsBl} 2160 DATA b6,ed,49,c9,21,00,20,11,01,308
{HsBm} 2170 DATA 20,01,00,80,36,00,ed,b0,c9,33d
{HlBn} 2180 DATA 01,10,f6,ed,49,21,80,a3,11,392
{NrBj} 2190 DATA 00,08,3e,16,cd,a1,bc,11,80,317
{FoBk} 2200 DATA 5c,dd,19,dd,22,00,00,01,00,252
{EoBl} 2210 DATA f6,ed,49,c9,11,00,20,21,00,347
{MsBj} 2220 DATA 20,7e,b7,28,26,32,5a,be,22,30f
{OiBk} 2230 DATA 68,be,23,7e,b7,20,1b,2b,01,2e5
{HuBl} 2240 DATA 00,00,09,2b,7e,b7,20,11,2b,1c5
{DqBl} 2250 DATA 7e,b7,28,0c,21,00,00,3a,5a,21e
{GwBn} 2260 DATA be,4f,06,00,ed,b0,2b,23,7c,37a
{NuBl} 2270 DATA fe,9b,c2,49,be,af,12,13,7a,4b0
{ArBm} 2280 DATA fe,9b,38,f8,c9,21,00,9b,2b,479
{AxBn} 2290 DATA 7e,b7,28,fb,11,00,20,ed,52,3c8
{OmBk} 2300 DATA cd,6e,bc,af,32,44,bf,22,4c,449
{OoBk} 2310 DATA bf,7c,cb,3f,cb,3f,cb,3f,3c,495
{BxBl} 2320 DATA 32,c2,be,47,21,00,20,c5,e5,3e4
{JoBk} 2330 DATA 22,49,bf,21,44,bf,34,23,36,2db
{FiBm} 2340 DATA 00,78,fe,01,20,01,35,21,4b,239
{HjBk} 2350 DATA bf,36,00,78,fe,00,20,01,35,2c1
{GwBl} 2360 DATA 21,34,bf,11,40,00,3e,2c,cd,29c
{IvBj} 2370 DATA 9e,bc,e1,e5,11,00,08,3e,16,38d
{KwBl} 2380 DATA cd,9e,bc,e1,7c,c6,08,67,0e,4c7
{JkBk} 2390 DATA 10,76,10,fd,0d,20,fa,c1,10,38b
{GkBk} 2400 DATA be,01,00,f6,ed,49,c9,3d,c0,4b1
{DiBk} 2410 DATA dd,6e,00,dd,66,01,22,0c,bf,37c
{CxBi} 2420 DATA dd,21,00,20,dd,5e,02,dd,56,38e
{PjBk} 2430 DATA 03,7a,b3,c8,d5,e1,01,00,00,3af
{NsBk} 2440 DATA ed,42,f5,dd,22,21,bf,dd,5e,53e
{MtBj} 2450 DATA 00,dd,56,01,dd,19,f1,20,e0,41b
{FrBj} 2460 DATA 11,00,00,dd,e5,dd,e5,21,00,3b6
{FoBj} 2470 DATA 9b,c1,ed,42,44,4d,e1,ed,b0,59a
{PrAx} 2480 DATA 18,cc,00,00,00,00,00,00,00,0e4
{LrAv} 2490 DATA 00,00,00,00,00,00,00,00,00,000
{KoAw} 2500 DATA 00,00,00,00,08,70,01,00,00,079
{NpAv} 2510 DATA 00,00,00,00,00,00,00,00,00,000 ●
```

FREE MONEY!

Well, nearly. Each listing printed in *Type-Ins*earns its author a minimum of 15 smackeroonies. Get typing!

DE - PROTECT

If you've ever saved a protected program only to find that you've lost the original, then Adrian Forbes of Glasgow has written the ideal utility. It will load in protected BASIC listings and re-save them without protection.

```
{HmAr} 1 ' BASIC de-protector
{EsAs} 2 ' by Adrian Forbes
{PiBn} 3 ' |DP,"FILENAME" or a$="FILENAME":|DP,@a$
{FvAl} 10 tot=0
{PtAp} 20 FOR a=&B000 TO &B066
{ClAx} 30 READ a$:POKE a,VAL("&"+a$)
{AjAv} 40 tot=tot+VAL("&"+a$)
{IkAj} 50 NEXT
{CqCj} 60 IF tot=&2878 THEN CALL &B000 ELSE
       PRINT"** Error in data **"
{GvBi} 70 DATA 21,0A,B0,01,0E,B0,CD,D1
{CuAx} 80 DATA BC,C9,FC,A6,0E,B0,13,B0
{LqAx} 90 DATA 18,04,C9,44,D0,00,DD,6E
{LtAv} 100 DATA 00,DD,66,01,7E,32,00,50
{IvBi} 110 DATA 23,5E,23,56,ED,53,01,50
{MmBi} 120 DATA 3A,00,50,47,2A,01,50,11
{DoAv} 130 DATA 00,90,CD,77,BC,ED,43,03
{KkAx} 140 DATA 50,21,00,10,CD,83,BC,CD
{CoBi} 150 DATA 7A,BC,3E,07,CD,5A,BB,CD
{PrAw} 160 DATA 18,BB,3A,00,50,47,2A,01
{MmAw} 170 DATA 50,11,00,90,CD,8C,BC,21
{BnAw} 180 DATA 00,10,ED,5B,03,50,3E,00
{MlAt} 190 DATA CD,98,BC,CD,8F,BC,C9 ●
```

ARTSLOAD

David Carter of Woking has sent us this Program that loads *Advanced Art Studio* pictures from BASIC. It's ideal for incorpriating into your own programs.

```
{MjBn} 1 'Advanced Art Studio screen loader
       V.1.
{BlBj} 2 '24.6.89  Public Domain by David Carter.
{BvBp} 3 'This will not set the border or the
       mode!
{FtAj} 4 '
{BsBk} 50 CAT:INPUT "Enter filename:",filename$
{BjAr} 60 DIM inks(15):i=-1
{JxBm} 70 MEMORY &8000:LOAD filename$+".PAL",&8000
{JjAu} 80 FOR x=&8000 TO &80C8 STEP 12
{OmAq} 90 c$=CHR$(PEEK(x))
{JnAq} 100 RESTORE 170
{KjAr} 110 FOR q=0 TO 26:READ in,q$
{OlBq} 120 IF c$=q$ THEN GOTO 130 ELSE NEXT q:GOTO
       140
{PkAr} 130 i=i+1:inks(i)=in
{EwAl} 140 NEXT x
{CpAx} 150 FOR a=0 TO 15:INK a,inks(a):NEXT a
{FrAx} 160 MODE 0:LOAD filename$+".scr",&C000
{PwBi} 170 DATA 0,T,1,D,2,U,3,\,4,X,5,]
{JkBk} 180 DATA 6,L,7,E,8,M,9,V,10,F,11,W
{GuAv} 190 DATA 12,^,13,@,14,_,15,N,16,G
{AwAx} 200 DATA 17,O,18,R,19,B,20,S,21,Z
{ArBj} 210 DATA 22,Y,23,[,24,J,25,C,26,K ●
```

THE BALROG

THE BALROG is shipwrecked, but manages to get his column back in a bottle...

Greetings, wandering ones, and welcome to the hallowed pages of *The Balrog*. This month sees some special offers from Topologika, a review of the first *PAW* game out on the CPC (and it's free as well!) and all your regular favourites.

The Island

Ken Bond ● 17 Adel Park Gardens, Adel, Leeds, West Yorkshire LS16 8BN ● Tel 0532 672278 ● £3 disk-only or free if you send a disk and SAE to Ken.

The Balrog loaded *The Island* with anticipation – it is the first game I have seen written using Gilsoft's *Professional Adventure Writer* (*PAW*) and hence I was interested to see what the system could create.

I was not disappointed! *The Island* is a lovely text-only adventure. You start on board an old tramp steamer, returning to Britain after a long sojourn in the Far East. Unfortunately, while you were sleeping, the ship hit a mine left over from the Second World War and in the resulting confusion you lost consciousness. You awake to find the ship rapidly sinking and the crew disappearing over the horizon in the ship's lifeboats! So you must try to escape from the ship before it sinks to the bottom of the sea...

Once you escape from the ship you find yourself on a deserted island complete with a lagoon, a shipwrecked seaman, and abandoned German U-boat and a mysterious pyramid.

The adventure is well-written and demonstrates *PAW*'s power expertly. True, it's only disk-based and has no graphics, but *PAW* games are no doubt the closest thing to Infocom that Amstrad owners will get nowadays. Locations and descriptions are atmospheric and long; there is a complex parser supporting RAMSAVE and RAMLOAD, and even commands such as "Look under" and "Look behind"!

But, best of all, the game is *free*! Ken has decided to give the game away to anyone who sends him a disk and an SAE (or just a £3 cheque). In short, a great game that is well-written and is a giveaway. I hope Ken realises the response he is letting himself in for! I look forward to reviewing his next game, *The Base*, soon...

Atmosphere	**70%**
Interaction	**63%**
Challenge	**80%**
AA Rating	**88%**



NEWS NEWS NEWS NEWS

Topologika has some special New Year offers on its classic disk-only CPC adventures.

Until February 28th, each game is available at £11.95. If you buy two games you can deduct a further 10% from the total price, three games deduct 20%, four or more 40%. A similar offer, says Topologika, was popular around Christmas last year, so it's making it again!

Titles available include *Avon* (*AA*51, 87%), *Acheton* (*AA*29, 69%), *Kingdom of Hamil*, *Countdown to Doom* (*AA*26, 59%), *Return to Doom* (*AA*36, 70%), *Philosopher's Quest* (*AA*26, 58%), *Giant Killer* (a maths adventure for children of 9 to 13) and the economics simulation game *Yes Chancellor*.

Topologika can be contacted on 0733 244682.



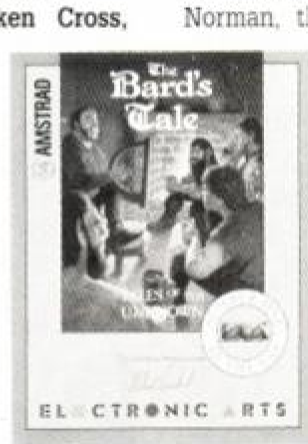
● New Year offers from Topologika.

BARD'S TALE CLUB

Calling all adventurers from Novice to Archmage – help your fellow Bardists!

▪ Neil Bailey is stuck in the game. "I can't understand the map supplied, so I can't find the Adventurers Guild and thus cannot get anywhere! Please, someone, help me!"
101 St Austell Avenue, Broken Cross, Macclesfield, Cheshire SK10 3NY

▪ Stuart Whyte has completed the game three times now (wow!) and has Mangar as his special character. His only problem now is that he has bought *Protext* on ROM and somehow the ROM interferes with the game!
53 Ridgeway Road, Timperley, Altrincham, Cheshire WA15 7HL



▪ Philip "The Bard" Haddigan has explored everywhere in the game and thus is well-qualified to help you with any of your problems...
49 Main Street, Fairlie, Ayrshire, Scotland KA29 0AB

▪ "I have a very powerful party, including Norman, the 23rd level Paladin and two archmages, but I am stuck – I can't get anywhere apart from the Mad God's Catacombs and the Baron's Castle – and I am tired of slaying poor, defenceless Green Dragons.

How do I get further?" asks besieged adventurer Lawrence Gilson.
91a Purbook Gardens, Purbook, Portsmouth, Hants PO7 5LE. Tel 0705 262984

The Balrog's Cluepot

This month's collection of clues comes to you from jerome Young, Antcrusher, Graham Wheeler, Trevor Fuller, Lawrence Gilson, Philip Haddigan, Adrian Forbes and Joan Pancott – all true adventurers...

Bards Tale

- The pureblade is only useful with paladins.
- The name of the mad god is Tarjan (in case you didn't know).
- Let the Bard sit on the Baron's throne.

Colossal Adventure

- From West End Hall of Mists, S, E, Sx3, N, E (orange column), N, E, NW, get Pirate's chest and the treasure stolen by the pirate, SE, N, D orange column to splendid chamber.
- From West End Hall, S, E, W, E, W to the vending machine (you can drop coins to buy batteries, but they are treasure and you will lose points), W, E to West End Hall, N, E, E to Hall of the Mountain Kings.

Cutthroats

To find proof that Weasel is double-crossing your party with McGinty, after you have purchased your equipment go to the Ferry Landing. Wait until you see McGinty and Weasel together. Wait, and you will see Weasel give McGinty something. Now go to the Back Alley behind the vacant lot, wait until you spot McGinty going west, wait until you see him return and go west for a second time. Open window, N, get envelope...

Hollywood Hijinx

To enter the house turn the statue west. *Twice!*

Imagination

Drop the coals near the forest to melt the snow. You can also use them to attract the bull. The chips are in the dispenser. Give the child with the yoyo the icicle.

Knight Orc

Run to castle, throw spear at drawbridge. Go onto bridge and drop something. Go to the top of the castle and look. You will get a list of all the areas you can run to.

Kinghtmare

Give the old man food and water. He will then give you a spade. Open the door and leave. Go to the locked door and dig ground.

Leather Goddesses of Phobos

To Un-Angle the Princess, Drop machine (that removes "T"s), open machine, put jar in machine (jar of untangling cream), close machine, switch on machine, open machine, get jar, cover princess with cream (she is changed back and the King gives you the angle). Get angle...

Help!

Trevor Fuller is stuck in *Rigel's Revenge* – he has scored 40% but cannot get out of no-man's land (he has the mine detector)...



JUST FOR LAUGHS

Have you just found an amusing response in a game? If so, send it in and receive undying fame by being mentioned in *Amstrad Action*! Thanks this month go to Kend Bond and Simon Netherwood for their selection of amusing responses.

Boggit
Try swearing, why and hello.

Hollywood Hijinx
- Put the film called the corpse line in the projector and run it!
- Dig in sand at beach and then answer hand.

Leather Goddesses of Phobos
An old one, this, but for those who missed the original review, try tying the hose to the cage.

Lurking Horror
Try swearing.

Very Big Cave Adventure
Try swearing.

BALROG'S POST

● "Welcome Balrog! Your help is needed. I am an avid fan of adventure games (in particular text-only), and also enjoy creating my own with either the *Quill* or *GAC*. I would like an opinion on whether or not my adventures are of a marketable quality. Who could give me this help?"

Thus writes A Guthrie of Aberdeen. Well, the best people to ask are the experts on adventures themselves – the players! Some software companies used to (and still do) market any old rubbish (not mentioning any names!), but the best person to ask is a Lord or Lady of Adventure.

But before you ask them, play-test the game thoroughly – if possible, send the game to friends to test for you. Their suggestions and criticisms can convert a game from bad to great!

Mr Guthrie goes on to ask where he can complete his Level 9 collection – the simple answer is to write to Level 9. The company should still have stocks of nearly all the games on the CPC.

The Balrog gets a lot of pleas from people wanting older games. There is no real place to get them from but by checking out mail order companies, the company that made the game or, failing that, by placing an advert in *AA*'s own *Helpline* or in an adventure fazine (such as *Adventure Probe* or *Spellbreaker*).

● Dave Havard has written in raising many interesting points.

"As an ex-Spectrum owner, I upgraded to my Amstrad (Amy) as I wanted to play Infocoms, and since then I have never looked back. I especially enjoy programming adventures on my Amy using *GAC*, *PAW* and *Quill* and I look forward to reading your comparison of creators and the programming series.

Having been an adventurer for many years I like to think I know what makes a good adventure – reasonable length loacation descriptions, logical mapping, good use of Examine, separate responses to search, logical problem solutions and, obviously, a good plot that doesn't weaken at the end.

Some things to avoid are the instand/random death syndrome, in-jokes that are understood only by a few people, movements taking you from "A Forest" to "An Oil Rig" etc, responses such as "You can't" with no apparent reason why – and my particular hate *word matching*, when you know you have the correct solution to a problem but are unable to find the correct input due to lack of synonyms. A classic example of the latter is "KILL ELF WITH BOW" in *Forest at the World's End*. No other response will succeed and each go there is a chance the elf will kill you while you are typing things such as "SHOOT ELF WITH ARROW" or "FIRE ARROW AT ELF"!"

I couldn't agree with you more, Dave! As to the adventure creator reviews, please bear with me, I am still waiting for *ADLAN* to be released by Graduate.

In the meantime, *Programming with the Balrog* starts this issue...

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13. ATV SIM
14. GHOST HUNTERS
15. STREET FOOTBALL
16. JET BIKE SIM
17. SAS COMBAT
18. BIGFOOT
19. NINJA MASSACRE
20. FAST FOOD
21. ARCADE FLIGHT SIM
22. BMX SIMULATOR 2
23. THE HIT SQUAD
24. TRANSMUTER
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30. TREASURE ISLAND DIZZY

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Programming with the Balrog

Have you got any tips for writing adventures? If so, send them in – or I'll have to come round and eat you! But before you put pen to paper, here are a few challenges that I am sure are possible... (Thanks to Stuart Whyte and Mike Barnard for thinking of features they would like to see in their games. If you can help them, or if you know of a tip for a utility then send it in!

- How do you use different styles of font from *GAC* (as Sandra Sharkey used in her *Case of the Mixed-Up Shymer*) – or any other utility?
- Has anyone out there written any extern routines for *PAW*? Routines such as graphics or sound would add greatly to the value of a game.
- Has anyone worked out how to select a random number between two limits and used it to select a message? Then you could, for example, choose a random message for an event from a list of messages. You can't do that in *PAW* and with *GAC* you can only choose between O and X, not X and Y.
- How about an extern routine for *PAW* that accesses the disk? Then, in theory, you could write an Infocom game...

Mike also has a few things to complain about concerning today's creators.

"I find I use a lot of messages for things that happen around the player, like weather (wind, rain, wet, dray, warm, cold...) and so the usual limit of 255 messages quite quickly gets used up (yes, I do use system messages to effect). I wish that the writers of these creators would use 2 bytes to number messages and allow us to use as many messages as the machine memory allows. Also, how about the ability to input new nouns into a game? Then I could name the players (as in *Seastalker*), have items in his favourite colour (as in *Moonmist*), write a message on a wall etc. This all adds up to increasing the atmosphere in a game, being able to see the world in the computer within your own mind, thus adding to your enjoyment."



CONTACTING THE BALROG

Readers can always contact the Balrog via *Amstrad Action*. Watch out next month for reviews of all the adventure clubs and magazines available, the latest game from the maker of *Treasure Tunnels* and *Dungeons, Amethysts, Alchemists 'n' Everything* and of course your regular favourites.
See you then!

The Lords and Ladies of Adventure

As always, send an SAE and say where you are stuck...

Classic Adventure • Eye of Bain • Fantasia Diamond • Golden Apple • Golden Baton • Hobbit • Hollywood Hijinx • Inca Curse • Invincible Island • Mountains of Ket • Oracles Cave • Perseus and Andromeda • Planet of Death • Sorcerer • Temple of Vran • Urban Upstart • Velnor's Lair

Dave Havard, 21 Belvoir Close, Fareham, Hants PO16 0PJ

Boggit • Hobbit • Fantasia Diamond • Forest at the World's End • Heroes of Karn • Hitchhiker's Guide • Jewels of Babylon • Kobyashi Naru • Lurking Horror • Rigel's Revenge • Very Big Cave Adventure

Simon Netherwood, 36 Toothill Bank, Rostrick, Brighouse, West Yorkshire HD6 3EZ. Tel 0484 719325 (Monday-Friday, 5-9pm)

Adventure Quest • Aftershock • Angelique a Grief Encounter • Arnold goes to Somewhere Else • Big Sleaze • Black Fountain • Bugsy • Case of the Mixed Up Shymer • Castle Blackstar • Castle of the Skull Lord • Crystal Theft • Cursed be the City • Cutthroats • Dracula • Dungeon Adventure • Dungeons, Amethysts, Alchemists 'n' Everything • Enchanter • Escape from Koshima • Espionage Island • Fantasia Diamond • Fish • Football Frenzy • Forest at the World's End • Frankenstein • Gnome Ranger • Gremlins • Guild of Thieves • Haunted House • Hermitage • Heroes of Karn • Hitchhikers Guide • Hollow Graphic • Hollow Text • Hollywood Hijinx • Hunchback Adventure • Imagination • Inca Curse • Infidel • Ingrid's Back • Jack the Ripper • Leather Goddesses of Phobos • Lifeterm • Lords of Time • Lurking Horror • Mansion • Message from Andromeda • Mindshadow • Monsters of Murdac • Mordons Quest • Mountains of Ket • Mystery of Indus Valley • Myth • Necris Dome • Never Ending Story • Nova • Nytheyhel • Pawn • Planet of Death • Planetfall • Questprobe • Rebel Planet • Rigel's Revenge • Robing of Sherwood • Robocide • Seabase Delta • Shard of Inovar • Sharpe's Deeds • Ship of Doom • Smashed • Sorcerer • Souls of Darkon • Spellbreaker • Spytrek • Star Wreck • Subsunk • Theseus • Top Secret • Trial of Arnold • Blackwood • Venom • Very Big Cave Adventure • Warlord • Winter Wonderland • Wise and Fool of Arnold Blackwood • Wishbringer • Wolfman • Zork I, II and III (!)

Graham Wheeler, 2 Burford Close, Southdown, Bath, Avon BA2 1JF. Tel 0225 426919 (1-10pm)



CHEAT MODE

Who says cheats never prosper? Mugs who don't check out *Cheat Mode*, that's who!



Mr. HELI

Finding those muddies hard going? Have you got stuck on Firebird's cute blaster *Mr Heli*? Then fret no more, for here are the passwords to take you to the second and third levels:

```
Level 2:      CACGFAAAAUAEDIADCKCY
Level 3:      DECIHAFAAUAIGAADCDBR
```

Just in case you're still not happy, **Graham Smith of Street** has designed a wee poke to help you on your destructive way. Immortality for disk-based choppers everywhere is the result. **DISK**



```
{MwAr} 1 ' Mr Heli  -disc-
{HvAq} 2 ' By Graham Smith
{EwAs} 3 ' Infinite lives
{FtAj} 4 '
{DmAr} 10 FOR j=0 TO 40:READ a$
{BmAt} 20 x=VAL("&"+a$):y=y+x
{MkAs} 30 POKE j+176,x:NEXT j
{MlAq} 40 IF y<>3071 GOTO 100
{LmAt} 50 MODE 1:PRINT"Insert ";
{GpAu} 60 PRINT"game disc then ";
{PqAt} 70 PRINT"press any key"
{JiAt} 80 CALL 47896:CALL 177
{JuAl} 90 GOTO 50
{CsAr} 100 PRINT"DATA ERROR
{JxAt} 110 DATA 84,21,b0,00,cd,d4
{AwAx} 120 DATA bc,79,22,60,00,32
{MkAu} 130 DATA 62,00,21,00,01,11
{LvAu} 140 DATA 00,00,0e,41,df,60
{EoAs} 150 DATA 00,21,d2,00,22,86
{LqAt} 160 DATA 01,c3,00,01,af,32
{BqAt} 170 DATA 83,10,c3,62,04
```
●

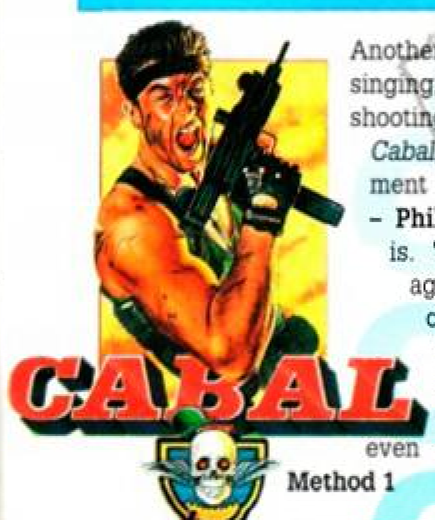


THE NEWZEALAND STORY



Fed up with being cute but beaten? To overcome the odds in Ocean's zoological spectacular *New Zealand Story*, simply type in this listing from Phil Howard of Mapperley. Kiwis the world over rejoice for immortality is yours! **Tape Method 1**

```
{AuAs} 1 'new zealand story
{FrAj} 2 '
{MpAq} 3 'infinite lives
{FtAj} 4 '
{KmAt} 10 DATA 21,16,BD,36,C3,23
{DkAt} 20 DATA 36,0E,23,36,BE,C3
{JmAt} 30 DATA CB,99,21,17,BE,22
{MqAt} 40 DATA 4e,A6,C3,08,A6,DD
{FxAt} 50 DATA 21,b8,A8,11,AB,00
{GwAt} 60 DATA CD,47,A8,21,2A,BE
{GsAs} 70 DATA 22,61,a9,C3,e2,a8
{LkAu} 80 DATA 3E,BE,32,3B,7E,C3
{NoAm} 90 DATA 00,9C
{CkAp} 100 y=0:MEMORY &5000
{BxAs} 110 FOR x=&BE00 TO &BE31
{PxAu} 120 READ a$:a=VAL("&"+a$)
{MmAt} 130 POKE x,a:y=y+a:NEXT
{CxAu} 140 IF y<>&15AD THEN 170
{LrAp} 150 LOAD"NZSTORY
{LtAo} 160 CALL &BE00
{BjAs} 170 PRINT"data error!"
```
●



CABAL

Another Ocean all singing, all dancing, all shooting spectacular, *Cabal*, gets the treatment **Howard's Way – Phil Howard**, that is. This gives the aggressive little chap infinite lives, making things a little one-sided but even more fun! **Tape Method 1**

```
{DsAm} 1 'CABAL
{FrAj} 2 '
{BrAs} 3 'INFINITE LIVES.
{FtAj} 4 '
{KmAt} 10 DATA 21,16,BD,36,C3,23
{DkAt} 20 DATA 36,0E,23,36,BE,C3
{PwAs} 30 DATA 8A,9A,21,17,BE,22
{MqAt} 40 DATA 4e,A6,C3,08,A6,DD
{MqAt} 50 DATA 21,b8,A8,11,B0,00
{GwAt} 60 DATA CD,47,A8,21,2A,BE
{JjAu} 70 DATA 22,66,a9,C3,e2,a8
{GjAu} 80 DATA 3e,00,32,72,19,c3
{FiAn} 90 DATA 00,01
{CkAp} 100 y=0:MEMORY &5000
{BxAs} 110 FOR x=&BE00 TO &BE31
{PxAu} 120 READ a$:a=VAL("&"+a$)
{MmAt} 130 POKE x,a:y=y+a:NEXT
{PiAs} 140 IF y<>&13F0 THEN 170
{JuAm} 150 LOAD"CABAL
{LtAo} 160 CALL &BE00
{BjAs} 170 PRINT"data error!"
```
●

BLACK BOX

Forgotten Worlds gets the Multiface treatment…

Address	Poke	Effect
00F3	00	Infinite energy Player One
00FD	00	Infinite energy Player Two
05DA	06	Lets Player Two use joystick two
05DF	67	
05E6	06	
05EB	47	
05F2	47	
05F9	06	
0605	06	

We've been overwhelmed buy the response to our *Batchallenge* in *AA*51. We wanted the complete *Batman* maps – ASAP! The best of the bunch came from **John Smiley** – whose address we've managed to lose in all the excitement. (So if you could drop us a line, John, we'll send on your prize.) The First and Fifth Levels are now yours for the taking. Track down the Joker at your leisure, safe in the knowledge of what's what and where's where. Remember, though, that even with the map on your side dancing with the devil in the pale moonlight is still a hazardous occupation. Tread carefully Batfans, and fight well!

● **A handy cheat for those people who are having difficultly in getting to the later levels has been left in by the Ocean programmers. Simply hold down the keys D,E,2,0, and 9 simutaneously to progress to the next level.**



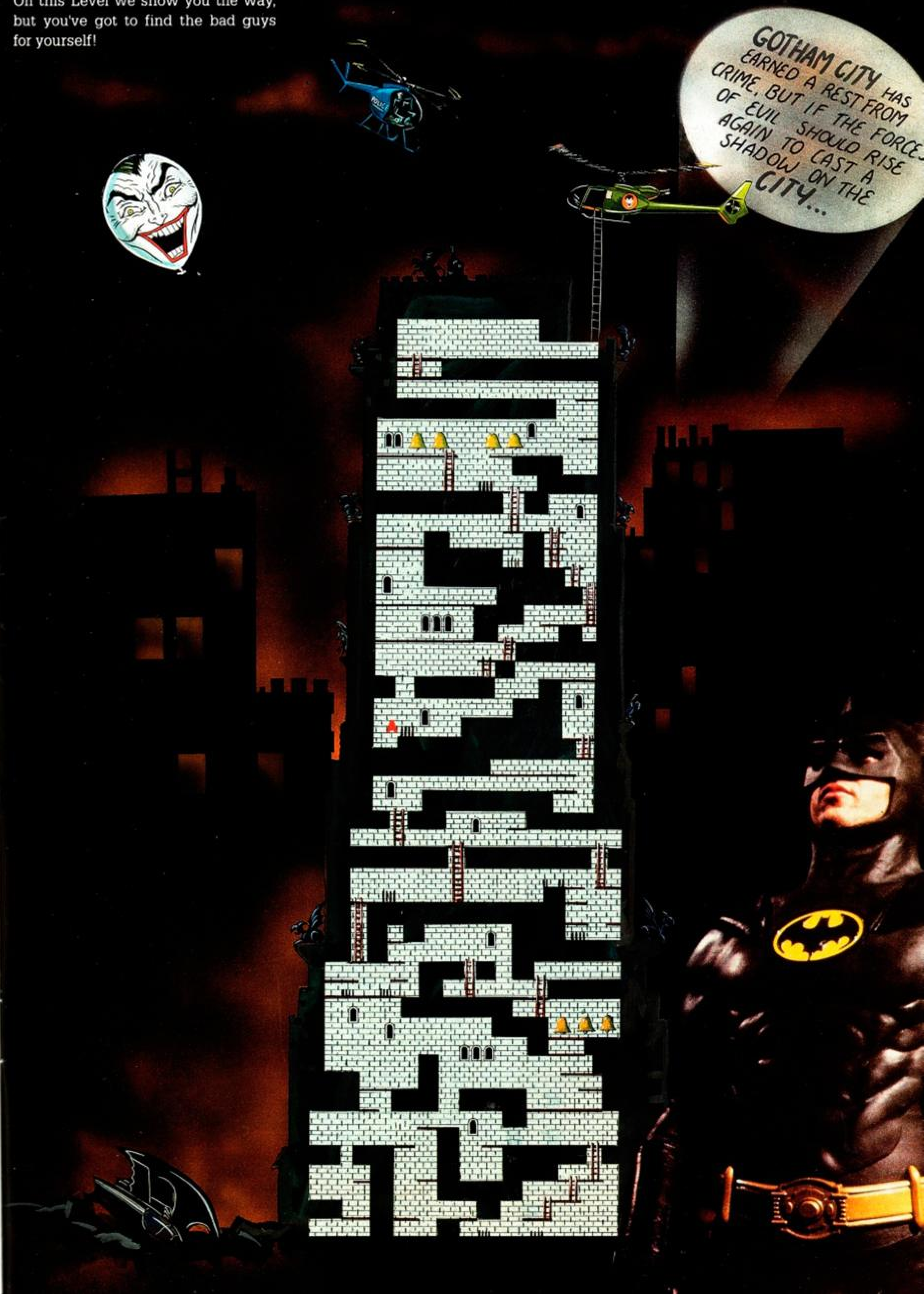


Splashdown! Can you send Napier to his doom in the toxic tomb? Throw your Batarangs as soon as you reach the final platform opposite him on Level One to find out.

Cathedral

Spiked and dangerous flooring **A**

On this Level we show you the way, but you've got to find the bad guys for yourself!

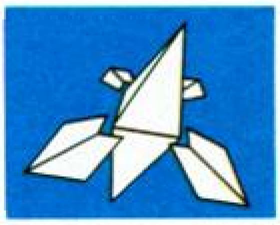


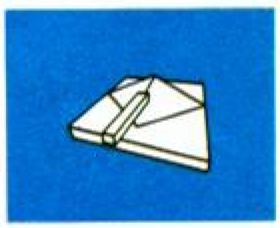
Password frenzy



● Cholo

Passwords for the robots:
Leadie = MCLEAN
Koke = LOREAN
Hacker = PLUGIN
Rats = REBELS
Plane = FLYBOY
Flying Eye = BRAZIL



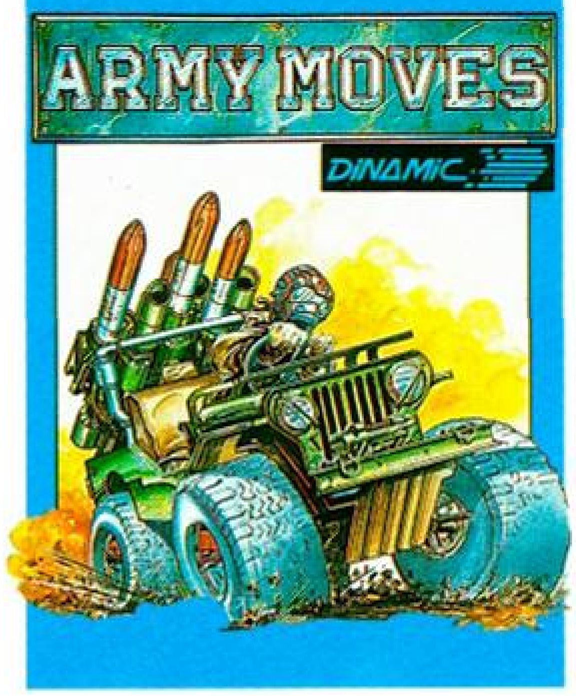


● Starion

Master Password is STEAMY

● Army Moves

The password for Part Two is 15372



● One Man and his Droid

Level 2 = Empire
Level 3 = Predatory
Level 4 = Ruminate
Level 5 = Ryegrass
Level 6 = Vacuum
Level 7 = Vampire
Level 8 = Ragout
Level 9 = Chain
Level 10 = Aasvogel
Level 11 = Blizzard
Level 12 = Cloche
Level 13 = Calendar
Level 14 = Ectoplasm
Level 15 = Ecology
Level 16 = Ferocious
Level 17 = Fetlock
Level 18 = Gooseberry
Level 19 = Gravitate
Level 20 = Up and away



● Agent XII

The two passwords are LOUDHAILER and PITIFUL LOBSTERS



ELITE CLUB

No roster this month, just a massive list of *Elite* Multiface pokes sent in by Colin Smith. Real Commanders wouldn't need them of course, but they're fun for a little recreational blasting to relieve the tedium of those long space flights hauling cargo.

ADDRESS	POKE	EFFECT
787C	00	}
7B61	00	} Indestructibility
6E63	C3	}
4902	21	} Cloaking device,
4906	F6	} operated using the
F908	00	} 'Y' key
8932	18	} ECM system jammer,
48CD	00	} operated using the
48C3	00	} 'E' key
4CF6	18	} Instant hyperspace
507F	00	}
4C08	00	} No hyperspace
4C12	00	} range limit
FE78	03	} Infinite credits
FE86	18	} (money/cash)
4F02	00	Infinite fuel
382D	00	Infinite missiles
4BFA	00	Constant galactic hyperspace
3849	00	Constant escape pod
3866	00	No cargo loss on ESCAPE
7A4F	00	No laser temperature rise
7AA8	00	One hit destroys ships
896B	00	Space stations launch Thargoids
8A8F	00	Missiles able to blow up space stations
2F6A	00	Constant energy bomb
2F7A	00	Remove blinding flash from energy bomb

Of these, only the cloaking device poke needs to be typed in at the start of every game, since this is reset at the beginning of EVERY game.

Mission Impossible!

A quick description of the first mission has been requested by some of the newer Commanders currently roaming around the galaxy. Well here's what to expect:

You must build up the correct number of 'Right on Commanders' before you'll get the mission. As explained before, these are earned by destroying things – asteroids that block space lanes, Thargoids that are just the wrong shade of green or even other Commanders if you want to take the rogue route.

Approximately 256 kills are needed for a message, but the value varies with the object destroyed – Thargoids earn more kills than asteroids, you'll be glad to hear. Get about three messages and you know it's mission time.

First you must leave Galaxy One. You never get given a mission there, and besides, it's no fun. When you enter a new system you will get the message 'Fuel Leak' and the screen goes red. You now have two courses of action. Firstly, get your fuel scoops out and head for the sun, or, if you've galactic hyperspace, head straight for a space station. When you arrive at the station use key 3 to sell some of your cargo and a message will appear, begging you to save the inhabitants from a horrible death. Being a nice sort of Commander (or pretending to be) say 'yes'.

Run from the station using any method available, (the system is no more by this point) and get the refugees to another space station. They don't care which one, as long as it isn't the one you've just left. On safe delivery you'll get a reward, just to say thanks for being such a nice Commander and being ever so brave and hunky. Then it's back to the old routine and starting to build up those 'Right on Commanders' for mission two, which is...

Yes, well that would be telling!

Insider Dealing

You can't keep a good man down. PHIL HOWARD is back one last time to ponder the principles of protection...

I expected to be gone this month, lost from sight, like the now historical eighties, in a pile of old *AA* mags. Needless to say, the prospect of not only seeing in the new decade, but more importantly, being around for the massive Future Publishing Christmas Bonus (*you what? – ed*), proved just too much of a temptation. Oh well, at least the New Year has arrived...

It does give me a chance, however, to clear up a few odds and ends that have been hanging around in the wings, waiting their opportunity to fit in. Also, to establish my credibility as a reviewer, er... put the records straight on a certain "easier" method to find those elusive cheats.

Altered states

Registers are memory locations allocated inside the Z80 processor. They are a place to store the result of calculation or data transfer. Usually, when dealing with machine code we use the registers AF, BC, DE and HL, but also within the processor are another group called the *alternate* set. They are denoted by a dash, i.e. AF', and are available for use by the programmer, often to temporarily store variables etc.

The instruction &D9 (EXX) can be used to swap the contents of all the registers with the contents of their alternates. This in itself is pretty dull stuff, but it's useful to know that one of the alternate registers, BC' is used by the CPC itself. B holds the address of the gate array and C the current ROM state and screen mode (it says in the hardware manual).

Whilst the interrupts are disabled the data in BC' is of little importance, but if you need to regain control and use the CPC's operating system, you must make sure that BC' is set up properly (&7F8D mode 1 – &7F8E mode 2). I tell you this because one of the major protections messes about with these registers, and it took me quite a while to discover what was going on.

A two-player fix

The INDEX REGISTERS IX and IY are used in most programs and are rather unusual. Their speciality is that, although they can be as versatile as HL for finding the contents of addresses (use (IX) just like (HL)), it is possible to add a constant to the address, thus Ld

A BITTER PILL

There have been many people who have bought a utility called *Poke-Easy Plus+* and are finding difficulty persuading it to do anything useful. Colin O'Neale writes; "Where on earth do they get the *easy*from?" The utility is no longer advertised by Galepersoft – probably just as well, the majority of its prospective punters would find it almost impossible to use.

Back in *AA*41 the enormous Paddy McD assesed *PEP* and gave it a semi-favourable review. He said "Generic programs like this are often Jacks of all trades. *Poke Easy Plus+* is more reliable than most, but still isn't perfect."

The basic concept is, I have to say, really good. The utility searches a program for sequences of bytes normally associated with pokes. The clever part, in my opinion, is that the game code is dealt with in 2K blocks, loaded individually from disk or tape. This allows all manipulation via RSXs from BASIC. The main disadvantage is that information provided is minimal, usually just a list of pokes to try out.

One thing, I found particularly poor, was that *PEP* practically ignores the fact that nearly all modern games are heavilly protected. There is a copier supplied for one very early protection system, which saves the code using a peculiar technique, via the screen memory. So if you like the loading screen, or if part of the game loads to this area, hard luck.

During the last five years there have been probably ten or so major protection systems, with a whole host of variants – plus of course the "one off" systems. Obviously some are more difficult to cope with than others, but a good set of utilities should be able to deal with at least 50 percent of these. *PEP* fails badly here. After all, what's the point of a poke-finding utility without any game code to work on?

I could only find one program that *PEP*'s copier would work on – *Short Circuit* – but this protection system was used on quite a number of games including *Arkanoid* and some of the earlier Codemasters stuff.

Instructions are given via RSX commands. | (shift + @) HELP displays a list of the commands available, plus the form in which they need to be used. The syntax isn't easy, and requires that the name of the file is put into a string, and then the command is suffixed with @N$, N$="BJCODE.BIN": |INFINITE,@N$. Those with the new ROM need not got to these lengths as using quote marks will do, i.e. |INFINITE,"BJCODE.BIN".

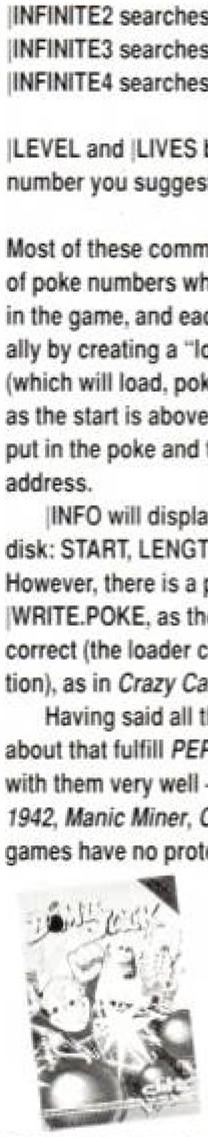
|INFINITE searches for DEC(HL)
|INFINITE2 searches for CP zero
|INFINITE3 searches for DEC A
|INFINITE4 searches for INC(HL) AND INC A

|LEVEL and |LIVES both search for Ld A, the number you suggest.

Most of these commands produce a fair-sized list of poke numbers which will alter something within the game, and each must be tried out individually by creating a "loader" with |WRITE.POKE (which will load, poke and run the game). As long as the start is above &170 you can use |LOAD; put in the poke and then CALL the EXECUTION address.

|INFO will display header details from tape or disk: START, LENGTH, EXECUTION, FILE TYPE. However, there is a problem when using |WRITE.POKE, as these details are not always correct (the loader contains different information), as in *Crazy Cars II*.

Having said all this, there are a few games about that fulfill *PEP*'s requirements, and it deals with them very well – *Bomb Jack, Space Harrier, 1942, Manic Miner, Chuckie Egg*, etc. All these games have no protection, are block-saved, and load in one go. If there are a number of loads, the poke must be inserted via a basic loader – or as an instruction in the game's loader. Alternatively, the whole game/part can be re-saved with the poke in place by using |COPY.POKE.



● *Bomb Jack*: can be 'got at' with *Poke Easy +*.

The commands |H.INFO, |H.LOAD, and |H.TRAN are intended for manipulation of Headerless files, which in the past have been used to create some protections. It is in theory a good idea, if you can find a game that uses one, and has not had the jump blocks restored (by calling &BD37). The prospective game must be run "" (CTRL+ENTER), after issuing the |H.INFO command. Ricochet's *Starquake* works in part.

All in all, it seems that nowhere near enough effort went into this utility. If there were some up-to-date de-protection routines and a more sophisticated poke detector (programmers NEVER use CP zero as a check for lives) it would help. Add a disassembler, a display of what is happening, and decent set of instructions and this utility could have been very useful. As it is, those without experience are finding it at best frustrating, at worst impossible.

A,(IX+3B) works. If IX were 0000, then Ld A,(IX+3B) would load A with the contents of memory location &3B.

These registers are sometimes used for the manipulation of variables during two (or more) player games, where more than one set of details have to be worked on simultaneously. The idea is that by altering the value in IX (or IY), the same block of program can handle entirely different sets of data.

They are a problem to track down. It is a help to know, however, that the only difference between IX and HL instructions is that they are prefixed with a &DD (IY is prefixed with &FD). &DD,&35,&3B is Dec (IX+&3B), so a search for &35 will turn up as many Dec(HL)s as IXs and IYs. In the example from *1943*, memory location &7B87 is checked to discover which player, then IX is set to the appropriate location, and the same bit of code from &7A1A to &7A22 decreases the current player's lives.

Pass the variables

It is worth a mention here that the IX register is used by the CPC to pass variables from BASIC to CODE, normally an awkward task. If you look at the keyword CALL in the *User Manual* you will find that it is possible to add a list of parameters to it. Once the command has been executed and control is passed into the code the IX register will "point" to the list of parameters which are stored in a similar manner to the STACK, last in first out order.

When issuing a command CALL XXXX,&1234,&5678:

```
(IX+0) = &78
(IX+1) = &56
(IX+2) = &34
(IX+3) = &12
```

Make that CALL

One of the first rules of programming is that, where possible, you write routines to deal with each individual function, and then link them all together using a main control program. You can then keep that main program small, add new subroutines as the need arises, and call the same function from different points in the program. It is on the whole a very organised way to write.

Some commercial programmers stick to these rules, some don't. Generally you should find that near the beginning of all games programs will be a main control loop of some sort, ranging from a vast list of CALL addresses to just half a dozen which call the main game areas. The program normally loops around the bank of subroutines performing each task in sequence.

If you are particularly stuck with a program it is worth removing one of these CALL addresses and then running the game to see what is missing. In this way you can isolate the section of code you are looking for. Replace the three numbers &CD,&D8,&19 (say) with 3 zeros. Alternatively, you could put a &C9 (return) at &19D8, but this depends on the code being in its final position,

BAT-LOOP

```
189D 21 00 00   L189D:      LD   HL,0000H
18A0 22 DA EE               LD   (0EEDAH),HL
18A3 CD 23 6F               CALL 6F23H
18A6 CD 34 26               CALL 2634H
18A9 CD 6F 1F               CALL 1F6FH
18AC CD 60 2E               CALL 2E60H
18AF 3A 9F 28               LD   A,(289FH)
18B2 E6 07                  AND  7
18B4 20 0A                  JR   NZ,L18C0
18B6 3A 9D 28               LD   A,(289DH)
18B9 1F                     RRA
18BA 30 04                  JR   NC,L18C0
18BC 21 42 C7               LD   HL,0C742H
18BF 35                     DEC  (HL)
18C0 CD 51 26   L18C0:      CALL 2651H
18C3 CD D9 E6               CALL 0E6D9H
186C CD F3 18               CALL 18F3H
18C9 CD D8 19   ---------> CALL 19D8H
18CC CD 8E 27               CALL 278EH
18CF CD 9C 26               CALL 269CH
18D2 CD 50 29               CALL 2950H
18D5 CD DA 18               CALL 18DAH
18D8 18 C3                  JR   L189D
```

● Part of the main game control loop from *Batman the Movie*. The call at &18C6 (CALL &19D8) deals with enemies and hazards.



Multiface owners should have no trouble. Removing this call from *Batman the Movie* will eliminate all the hazards in the game including the bad guys.

It is often helpful, on the other hand, after finding a promising subroutine to trace where it was called from. This can be normally be done by working backwards through the code until you come to a &C9 (return), the final instruction of the previous subroutine. Then use the BYTE-SEARCH to locate CALLS or JUMPS to the start of the routine you are interested in.

I hear you knocking

Last but by no means least, I think it's fair to say that the Amstrad's built-in protection has served its purpose. In these days of copying utilities/hardware it is of little practical use, except to foil those who wish to further their understanding of the CPC.

Here is a poke, given to me some years ago by Richard Montiero (remember him?), which allows you to load protected basic from tape. It is useful for the old Amsoft games; unfortunately it will only work on a 464. It's very rare the 464ers have something the others don't!

```
Poke &AC03,&C0 : Poke &AC02,&90 : Poke &AC01,&C3
```

Type the three pokes in, then use LOAD"" to load the program as you would normally.

1943-DEC

```
7A02 3A 87 7B               LD   A,(7B87H)
7A05 A7                     AND  A
7A06 CA 13 7A               JP   Z,L7A13
7A09 DD 21 85 7B            LD   IX,7B85H
7A0D 21 D2 C1               LD   HL,0C1D2H
7A10 C3 1A 7A               JP   L7A1A
7A13 DD 21 7B 7B L7A13:     LD   IX,7B7BH
7A17 21 90 C1               LD   HL,0C190H
7A1A DD 7E 00    L7A1A:     LD   A,(IX+0)
7A1D A7                     AND  A
7A1E CA 43 7A               JP   Z,7A43H
7A21 3D          --------> DEC  A
7A22 DD 77 00               LD   (IX+0),A
7A25 CB 3F                  SRL  A
7A27 F5                     PUSH AF
7A28 5F                     LD   E,A
7A29 16 00                  LD   D,0
7A2B 19                     ADD  HL,DE
7A2C F1                     POP  AF
7A2D DA 35 7A               JP   C,L7A35
7A30 0E 55                  LD   C,55H
7A32 C3 37 7A               JP   7A37H
7A35 0E 0D       L7A35:     LD   C,0DH
```

● IX is used to point to the variable area, IX+0 holds the lives for each player. Replace &3D (dec A) at &7A21 with &A7.



AA Buyers Guide

This is the place to find what software and hardware is available for your CPC. We list programs by category, and provide producer; phone number; price; issue in which the item was reviewed; and last but not least, a brief description of the program's features and, where appropriate, shortcomings.

But don't take our word for it: if you're in doubt read the original review before you splash out, and make sure by asking the person you're buying from that it meets your particular needs. Best of all is a try-out, if you can find a friend who has what you're thinking of buying.

WORD PROCESSING

Brunword

Brunning Software ☎ 0245 252854
£30.00 (6128) disk, £25 (464) disk ● *AA24*
Complete word processor package with spelling checker, 30,000-word dictionary and card filing programme. Spell checker and dictionary loaded with the main programme. 40, 80 and 128-column screen modes and fast screen response. Tutorial file makes learning the system easy.

Pendown

Logotron ☎ 0223 323656
£19.95 disk ● *AA18*
A complete tutorial in the theory and practice of word processing – it's great fun, too. Open system, owing much to expensive DTP packages.

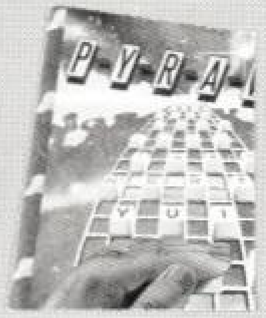
Protext

Arnor ☎ 0733 68909
£19.95 tape, £26.95 disk, £39.95 ROM ● AA3
Lightning fast on all tasks involving screen. True merging from separate files and disks to the cursor position is easy, and *Protext* supports standard CPC RSX's like DISC, TAPE, CAT etc. ROM version is excellent. Bad points: maximum file space limited to machine memory – about 22K on disk, 38K for the ROM version. As used by *AA*, if that's any recommendation (don't answer that).

Tasword

Tasman Software ☎ 0532 4388301
464, 464D, 6128, £19.95 tape, £24.95 disk ● *AA1*
464 is the tape based version (the same as *Amsword*). 464D has enhancements for a disk drive. 6128 makes full use of a 6128's extra memory. The latter pair include mailmerge facility. Easy to get to know: comprehensive help screens. Screen operations are slow, but may be customised for greater speed.

Pyraword



Discovery ☎ 0742 753423
£14.95 tape, £17.95 disk ● *AA18*
Similar in use to Discovery's Pyradev. It loads a profile of links, printer codes and character set. Word counting, changing disk drives etc – 'housekeeping' tasks – are handily located. Uses extra memory of 128K machines for spooling printed documents and storing text. True file merging is impossible, and control keys are odd. Margins cannot be set further apart than 80 columns, although placing a printer control character at the right hand side allows wider documents to be printed.

Wordstar

Micropro/Cumana ☎ 0483 571666
£49.95 disk (CPM) ● *AA1*
Files can be as big as the space available. A professional program, with huge manual and a layout like mission control. If you want a function, it is in there... somewhere. Not fast.

PRINTERS

Manufacturers' recommended retail prices are listed as guidelines, but heavy discounts are offered by retailers.

Amstrad DMP/2160

☎ 0279 454555
£149 including VAT ● *AA6*
Load through front: printer must be above paper; but loading continuous stationery is easy. Poor NLQ mode. £5 for ribbons. Low priced, rather than a bargain.

Amstrad DMP3160

☎ 0279 454555
£199 + VAT ● *AA29*
Similar to but faster than DMP2160. Accepts all IBM and Epson printing codes. NLQ is front loading system. Good buy.

Amstrad DMP4000

☎ 0279 454555
£349 + VAT ● *AA20*
A real text-cruncher. Wide carriage, and really flies across the paper, up to about 200 cps (in NLQ about 50 cps). Fonts available: standard 9 pin Pica, Elite, condensed etc. – but they are different, rather than just adjusted spacing for the same characters.

Amstrad LQ3500

☎ 0279 454555
£349 + VAT ● AA31
Cheapest 24-pin printer. Paper loaded from the rear – more time consuming. 30 cps in letter quality mode, and 62 cps in draft. Print quality excellent: plenty of different type-styles built in. Not ultra fast.

Citizen 120D

☎ 0800 282692
£199 + VAT ● *AA43*
Dimensions: 3.7 kgs, and 370mm x 90mm x 238mm. Draft quality is 'dotty,' and poor, but NLQ is sharp and simple. A quiet beast, with cable to the computer connected on the side. Manual includes a complete written breakdown of all the printer control commands, and their effects.

Epson LX800

☎ 01 902 8892
£279 + VAT ● AA29
Very fast for 9 pin. Control panel for style selection, and Epson compatible. Reverse winding sheets requires care, though.

Epson EX800

☎ 01 902 8892
£629 + VAT ● *AA29*
Upgradable in 101 ways – cut sheet feeds, serial ports, longer life ribbons. Quiet, with respectable printing speed. Sans Serif/Roman NLQ fonts incorporated. Control panel to select fonts – just the same font with different spacings.

Epson LQ500

☎ 01 902 8892
£399 + VAT ● *AA29*
Features galore and price to match. Handles both Sans Serif and Roman styles of NLQ, for instance. Colour-printing upgrade kit available. 24 pin printer, offering excellent quality printing. Control panel to select from many available fonts (ie. the same font at different widths).

Panasonic KXP3131U

☎ 0753 73181
£335.25 (discont.) ● *AA29*
Daisywheel therefore superb quality – but can't print bit graphics (no trendy screen dumps), and if you want different fonts, you have to plug in a different Diablo-compatible one. Not quiet.

Mannesmann Tally MT81

☎ 0734 788711
£149 + VAT ● *AA43*
Dimensions: 70mm x 100mm x 265mm; weight, 4.5 kgs. Prints Epson and IBM graphics. Draft mode print quality is good: square printhead pins put ink onto greater areas. The printed output is more ornate than the Citizen. Manual is superb, but falls down in failing to explain control codes: for that you have to buy the applications manual. Certainly a very good buy.

Panasonic KXP1081

☎ 0753 73181
£219 +VAT ● AA29
Similar to DMP2000/2160: chunky, 9 pins, 10 inch carriage and compatible with Epson codes. Thorough A4 manual, good NLQ mode – better than DMP – and condensed, draft and NLQ modes.

Star LC-10

☎ 01 840 1800
£229/299 + VAT ● AA32
First price is for standard dot matrix printer. Fonts selected by button, rather than typing in fiddly control code. Second

price is for relatively inexpensive colour model. The machine uses multi-colour ribbon to produce different mixes, though there are currently no commercial programs to take advantage of this capability *(but see the Colourdump review in AA46, page 24).*



■ INTEGRATED PACKAGES

Info-Script
Brunning ☎ 0245 252854
£50 disk ● 128K only ● *AA35*
Billed as the "complete database with word-processor and spelling checker," it's best with 256K. Well set up, easy to use and allows for changes in layout and content: recently 'supercharged'.

Protext Filer/Office
Arnor ☎ 0733 68909
£24.95/£34.95 disk ● *AA34*
Database that works comfortably with *Protext*, has powerful sorting options and comprehensive invoice printer. Can be slow, but good value.



■ EDUCATIONAL PROGRAMS

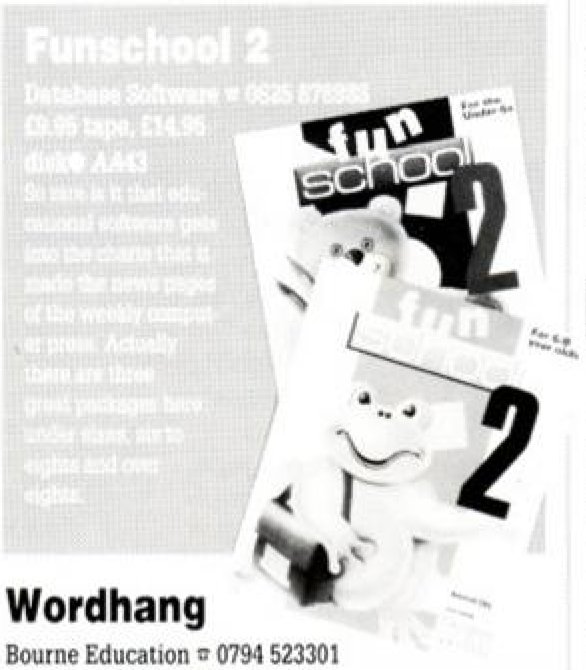
Amstrad Selection
Fernleaf Education ☎ 0474 359037
£25.95 disk/tape ● *AA32*
For age range 7 to 12+: Eightprograms – including*Fletcher's Castle, Market Stall, The Perfume Hunter, The Raiders, Ferry Captain, Treasure*, and *Thorn Sea*.

Arc Master Pack Plus
Arc Education ☎ 0472 812226
£48 disk● *AA32*
A massive pack of 90 programs: Junior; Primary; a parent/child adventure; DR Logo and word games. Each set available at £10 tape and £12.50 disk. Well presented with good graphics, reasonable musical ditties and plenty of options.

Kosmos
Kosmos ☎ 05255 3942
£9.95 tape, £13.95 disk● *AA32*
Answer Back Junior Quiz lets you either answer the question; make a choice from a number of options; or say whether something is true or false. There's also *Factfile 500*, sets of additional questions for the program: arithmetic, spelling, sport and natural history.

The other range from Kosmos: vocabulary tutors in French, Spanish, German and Italian.

Play School
School Software ☎ 010353 6149477
£9.95 tape, £14.95 disk● *AA32*
Six different utilities including Counting, Find It, Paintbox, Shapes, Match-up and How Much? Paintbox is the best. Other programs in the range are also worth a look, including *Biology, Chemistry* and *Physics* for older children.



Wordhang
Bourne Education ☎ 0794 523301
£9.95 tape; £14.95 disk ● *AA32*
One of Bourne's range of ten programs. Others include *Happy Letters, Numbers* and *Writing* (all Infant); *Timeman One/Two* and *Map Rally* (all Junior); and the excellent *Chemistry* and *Physics Revision* (Senior).

■ BUSINESS/ ACCOUNTS

● *See also* Pendown *in* 'Word Processing'

Protext Office
Arnor ☎ 0733 68909
£34.95 ● CPM+, 6128 only ● *AA34*
Requires *Protext* and *Promerge* to run. Information inputted using *Protext*. Mail merge templates included, and very well implemented invoice printing feature. A genuinely useful business system.

SD Microsystems range
SD Microsystems ☎ 0462 675106
General Ledger ● £19.95 ● *AA32*
Sales Invoicer Pack ● £19.95 ● *AA26*
Small Traders Pack ● £24.95 ● *AA26*
Stock Accounting System ● £39.95 ● 6128 only ● *AA32*
SD Microsystems have a range of quality small business systems. Consult original reviews for in-depth explanations of what each does and how it differs from the others – or better still, ring them and ask.

■ DATABASES

AtLast Plus
Rational Solutions ☎ 056681 511
£39.95 ● CPM+,128k machines only ● *AA30*
Powerful: developed into user's requirements. Data capacity restricted only by disk size, and splitting fields into smaller elements possible. Printed output impressive. Beefy processing.

Masterfile III
Campbell Systems ☎ 0378 77762
£39.95 CPM+ ● *AA30*
With parent/child records – enabling tying together of records, saving space and time. Screen layouts and reports menu selected; not for faint hearts, but good results.

Random Access Database
Minerva Systems ☎ 0392 437756
£29.95 disk ● *AA6*
40 or 80 column screen. Good mathematical and string operations . Random disk accessing gives speed and power.
● *See also* Info-Script *in* '4. Integrated Packages'

■ SPREADSHEETS

Mastercalc 128
Campbell Systems ☎ 0378 77762
£33 disk ● 128K machines ● *AA4*
Can show two parts of spreadsheet at once. Includes notepad and calculator. Easy to use, but the mathematical formulae can only consist of the four basic arithmetic options. Slows down as more data is entered.

Matrix
Audiogenic Software ☎ 01 861 1166
£34.95 disk ● *AA18*
Uses disk to store data – so good capacity on the plus side, but poor speed on the minus side. Graphic options excellent. Onscreen prompts rare, making it hard at first. Calculating power good.

Supercalc II
Amsoft/Sorcim ☎ 0277 230222
£49.95 CPM+ ● *AA4*
First class documentation. Calculations can be determinative – performed on whether or not cell's contents match given value. Excellent help prompts and arithmetic functions.

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Romantic Robot multiface 2+ - CPC	47.95	35.96	E
MP-2 modulator/power supply - CPC464/664/6128	29.95	22.46	C
DDI-1 1st 3" drive inc. interface & cable - CPC464	159.95	126.36	B
FD-1 2nd 3" Drive - CPC/+3 (6128/+3 also reqd. DL-2)	99.95	85.14	C
DL-2 cable - FD-1 to CPC6128/+3	6.95	5.56	E
Amstrad 170208 motor for cassette - 464 (service exchange)	---	7.24	D
PL1 lead, printer centronics parallel - CPC/+3/+2A	14.95	7.48	F
Panasonic 1081 parallel F&T NLQ printer	281.75	166.23	A
Star LC10 parallel F&T NLQ printer (reqs. PL1 lead)	297.85	152.74	A

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Maxell 3" discs DS/ALL 3" drives	BOX 10	29.90	17.94	E
Verbatim 3.5" DS/DD 135 TPI bulk discs c/w labels	PKT 10	25.00	8.75	E
Verbatim 5.25" DS/DD 40/80T bulk discs c/w labels	PKT 25	27.27	7.36	D
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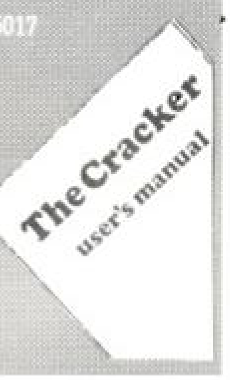
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Cracker

Newstar Software ☎ 0245 265017
£49.00 disk CPM+ ● *AA9*
Spreadsheets must be created from scratch. Documentation good, command sequences soon learned. Mathematical functions well done, with random numbers catered for. Files limited to 17K – and formulae programming not well implemented.



■ SOUND

Amdrum

Cheetah ☎ 0222 555525
£34.95 ● *AA13*
Digital drum machine. Editor comprehensive. Not Midi compatible: to hear output you plug it into amplifier.

DHCP Midi Interface

DHCP ☎ 0440 61207
£69.95 interface, £34.95+ disk s'ware ● *AA33*
DHCP produce Midi software for various Midi interfaces for CPC, which are incompatible with each other.

Miditrack Performer

EMR ☎ 0702 335747
£49.95 interface, £79.90/£89.90 tape/disk s'ware● *AA13*
Midi interface plus sequencing software to drive Midi equipped instruments. Records each instrument then plays them all at once. Onscreen layout similar to multi-track recorder. Excellent.

Sound Blaster

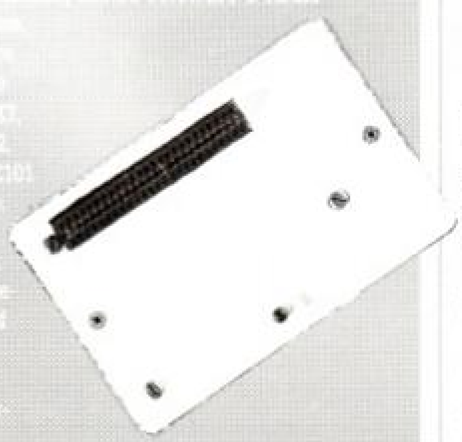
Siren Software ☎ 061 228 1831
£34.99 ● *AA23*
Amplifier and pair of loudspeakers that plug into CPC for maximum 2 watts sound effects.

Speech Synthesizer

DK'tronics (Datel) ☎ 0782 744707
£29.99 ROM
Add-on producing speech by RSX's: loudspeakers supplied. Cannot include speech in program for someone else's CPC, though. Even so, excellent speech quality and value.

Midi Interface

Silicon Systems ☎ 061 848 8959
£59.95 interface, £39.95 software ● *AA26*
Useless alone, but software you can use with it – DX7, FB01, MT32, D50 and CZ101 – is diverse. Software prices vary, and lack presentation of EMR sequencer. High performance.



Ram Music Machine

RAM Electronics (Datel) ☎ 0782 744707
£49.99 tape, £59.99 disk ● *AA17*
All in one music package: Midi interface, sound sampler and music editor. Sampler can handle one sample of just over a second. Midi controller software and music editor comprehensive. No through port, though, so 464 users must use tape version. And you can't edit live played Midi compositions.



■ VISION

AMX Art

Database ☎ 0625 878888
£69.95 disk (includes mouse) ● *AA7*
User friendly, if little unsophisticated compared to *Advanced Art Studio*, but mouse helps greatly. Colour, spraycans, textures, circles and host of other features.

Advanced Art Studio

EEC ☎ 0753 888866
£24.95 disk ● *AA21*
Recently revitalised, this is the user-friendly, best and most powerful art package: works in all three modes. Can cycle through inks, and cut and paste different areas, transformations and reflections. Fill routines in coloured patterns. Available as a standard version for £15.95.



Cherry Paint

Siren Software ☎ 061 228 1831
£9.99 disk ● *AA20*
WIMP controlled – ie mouse moves pointer to various icons to pull-down menus. B/W mode 2 only, but fun. Curves are difficult, but this is a bargain.

DART Scanner

Dart Electronics ☎ 0502 513707
£79.95 ● *AA22*
Attach reading device to your DMP2000, 3000 or 3160. Feed in picture to printer: device reads in picture as B/W image. Quality onscreen isn't amazing, but it works and it's fun.

The Informer

Treasure Island Software ☎ 0492 593549
£29 disk ● *AA33*
For creating animated displays, suitable for classroom and shop window: takes text, graphics and animated displays and produces slide show. Works best but not only with *Parrotry Plus* (see below).

Parrotry Plus

Treasure Island Software ☎ 0492 593549
£19.95 disk ● *AA30*
Rather than lots of effects used anywhere and at any time, *Parrotry Plus* 'remembers' every alteration and plays through the list to create animation. Note: can't dump pictures to printer without external program.

CRL Image System

CRL ☎ 01 533 2918
£19.95 tape, 24.95 disk ● *AA12*
Boasts range of picture manipulations and distortions, but lacks art options. Best on finished pictures – like a mini Quantel box.



Vidi Digitizer

Rombo Productions ☎ 0506 414631
£89.95 ● *AA15*
Grabs picture from video recorder or camera and puts it on CPC screen, allowing you to alter it with an package. Easy to use. Software on tape, disk or ROM includes superb printer dump routine.

Electric Studio Light Pen

Electric Studio ☎ 0462 420222
£19.95 cass, £29.95 disk● *AA1*
Excellent drawing software, including rubber-banding shapes and lines, filling areas, spray-can etc. Accepts software written for it.



● Corrections, additions or ideas for sections to be included are welcome. Drop a line to: *AA Buyers, Amstrad Action*, 4 Queen St, Bath BA1 1EJ

AAfterthought

The last page ever written in our old office in Queen Street (sob, sob!)

The official AA Pub lunch awards

In the wake of the annual Indin, the *AA* staffers decided to host their own awards ceremony.

So, after seconds of detailed and heated debate, the prestigious CPC Oscars were decided in an infamous Bath hostelry (Hatchetts next door). The good, the bad and the ugly of the Amstrad software scene were plucked out of a hat at random... er selected after considerable deliberation. The judges' decision is final, so no wingeing.

- **Biggest mistake of the year:** Amstrad – for supporting the Spectrum instead of the CPC on TV.
- **Second biggest mistake of the year:** Upsetting Emma Broadley (anyone).
- **Good decisions:** Hiring T Webb & A Waring.
- **Most original translation of a non-arcade licence adventure simulation:** *Pardon?*
- **Best programmers:** Tag Computer Games (may they rest in peace) (*indefinitely – ed*).
- **Most blatantly plugged game in *AA*:** *Lost Caves* (No home should be without one. A bargain at only £2.99).
- **Best journos' freebie:** Day at Brands Hatch. (Come on software houses, see if you can top that!)
- **Best Spectrum game:** Who cares?
- **Best 16-bit game:** Who can afford it?
- **Best CD Compilation:** Codemasters (trick question).
- **Most gallant losers:** Microprose All-Star Eleven (beaten 13-3 by Future Publishing).
- **Magazine of the year:** *Amstrad Action* (obvious, eh?)
- **Best *AA* covers:** Tie – 48 and 53 (yes, we really *are* that handsome).
- **Best Advertiser:** Jane Nolan – mail order supremo and not related to the singing sisters, honest.
- **Most missed AA feature:** *Sugarman*

EVERYONE'S A WINNER!

(WELL, TWO OF YOU, ANYWAY...)

- Shopper Comp

The winner of *AA*'s super grab-what-you-can compo was none other than Oliver Brown of Epsom, Surrey.

Oliver spent a day at the *Computer Shopper* Show, a treat capped by a hell-for-leather dash around Alexandra Palace picking up goodies by the trolley load (literally). Hope you had a good day, Oliver – let us know how you got on.

- Competition of a Lifetime.

The name of the winner of our fabulous competition to win MGT's Lifetime Drive has been drawn out of the offical cardboard box.

And... the winner is a Danish reader, Lars Chritiansen. Well done Lars, your prize is on its way!

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The result of many years research into the Football Pools by the programmer Martin Evans of C.C.S. the programme is a masterpiece of expertise and is simplicity itself to use.

- Predicts Homes, Aways and Draws.
- No fiddly typing in of teams etc. and no redundant databases.
- Instant read out or Hardcopy if you have a Printer.
- Uses scientific formula based on recent form home and away, league position, goals scored etc. It has long been realised that certain combinations of these factors return a much higher average of draws than the laws of average would expect. **POOLSMASTER** looks for these factors and analyses their significance to give you the best possible chance of a win.
- Also has a 'Sequence Predictor' option. Many people believe that certain numbers on the coupon come up more often than others and over a season patterns do seem to develop. The programme analyses these patterns and predicts the numbers most likely to come up next. Certainly more scientific than sticking a pin in or family birthdays etc!

If you do the POOLS then this is the programme for you.

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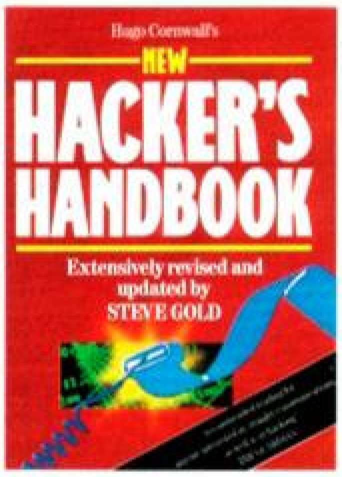
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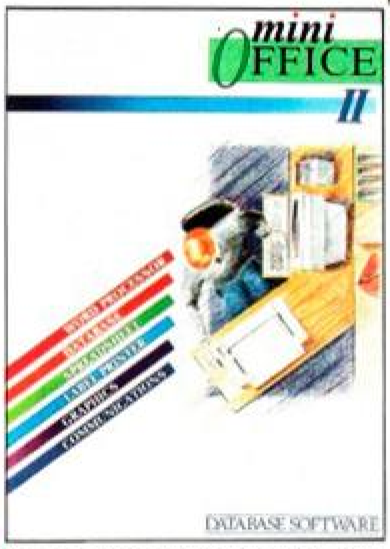
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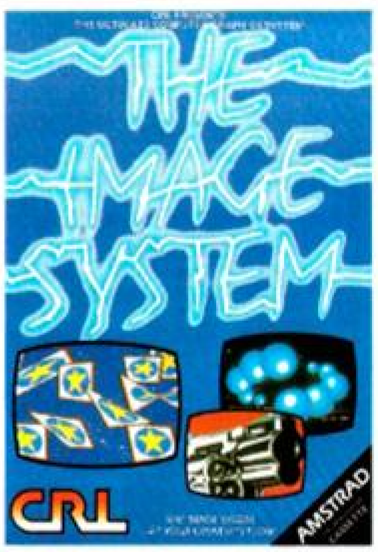
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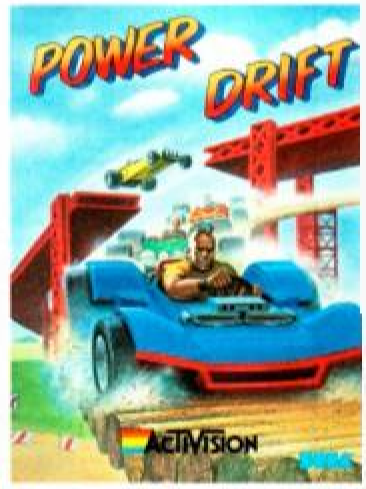




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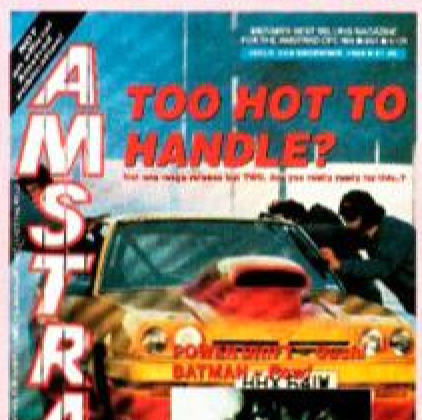
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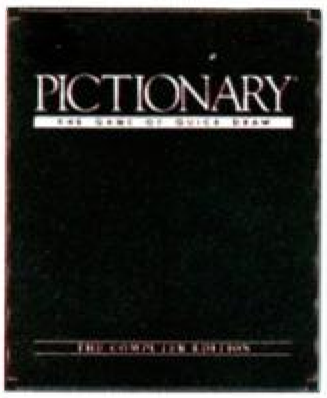


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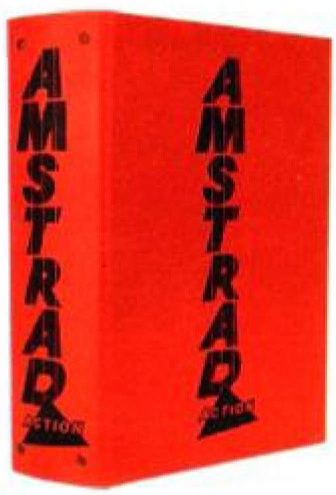


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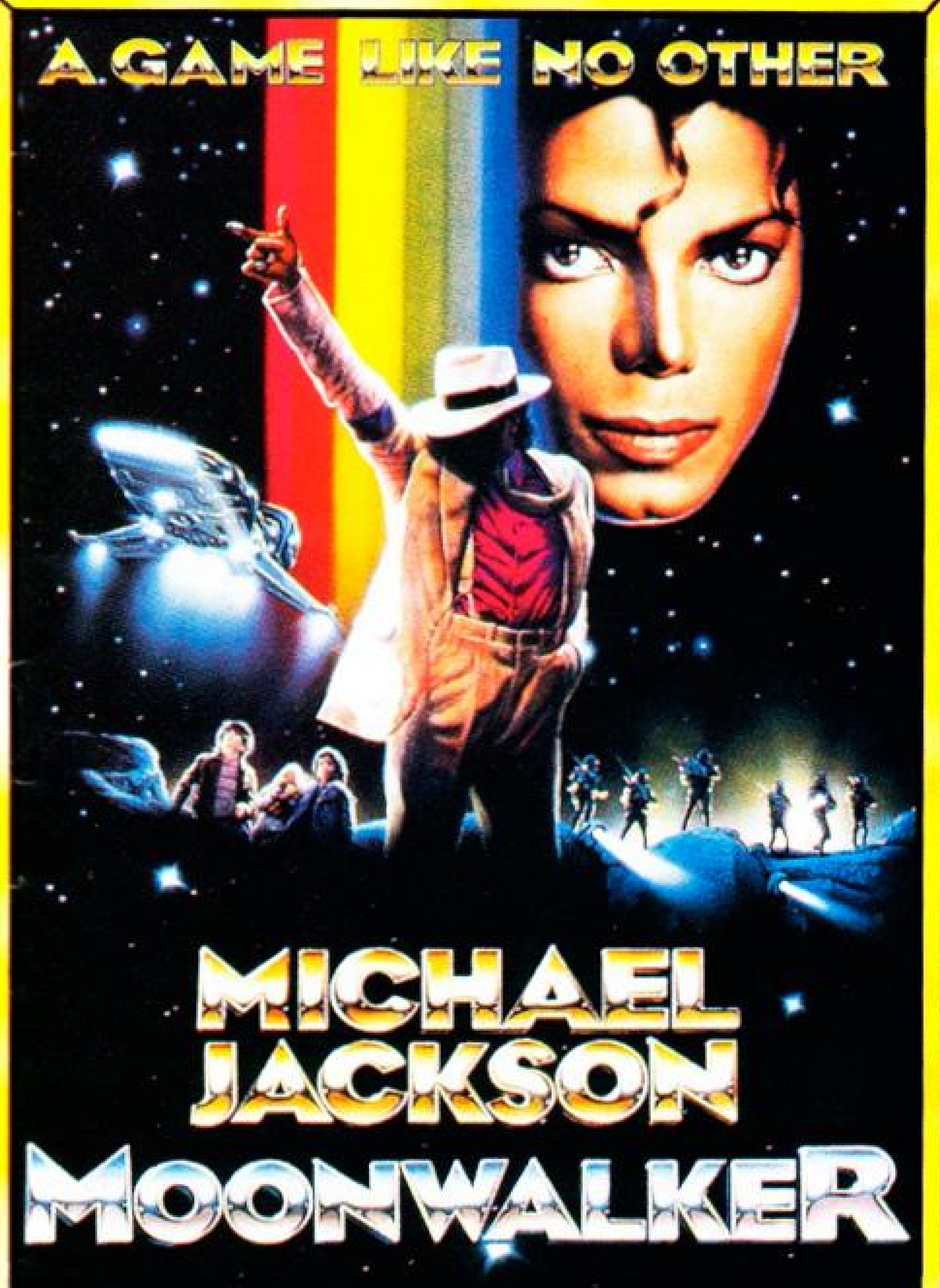
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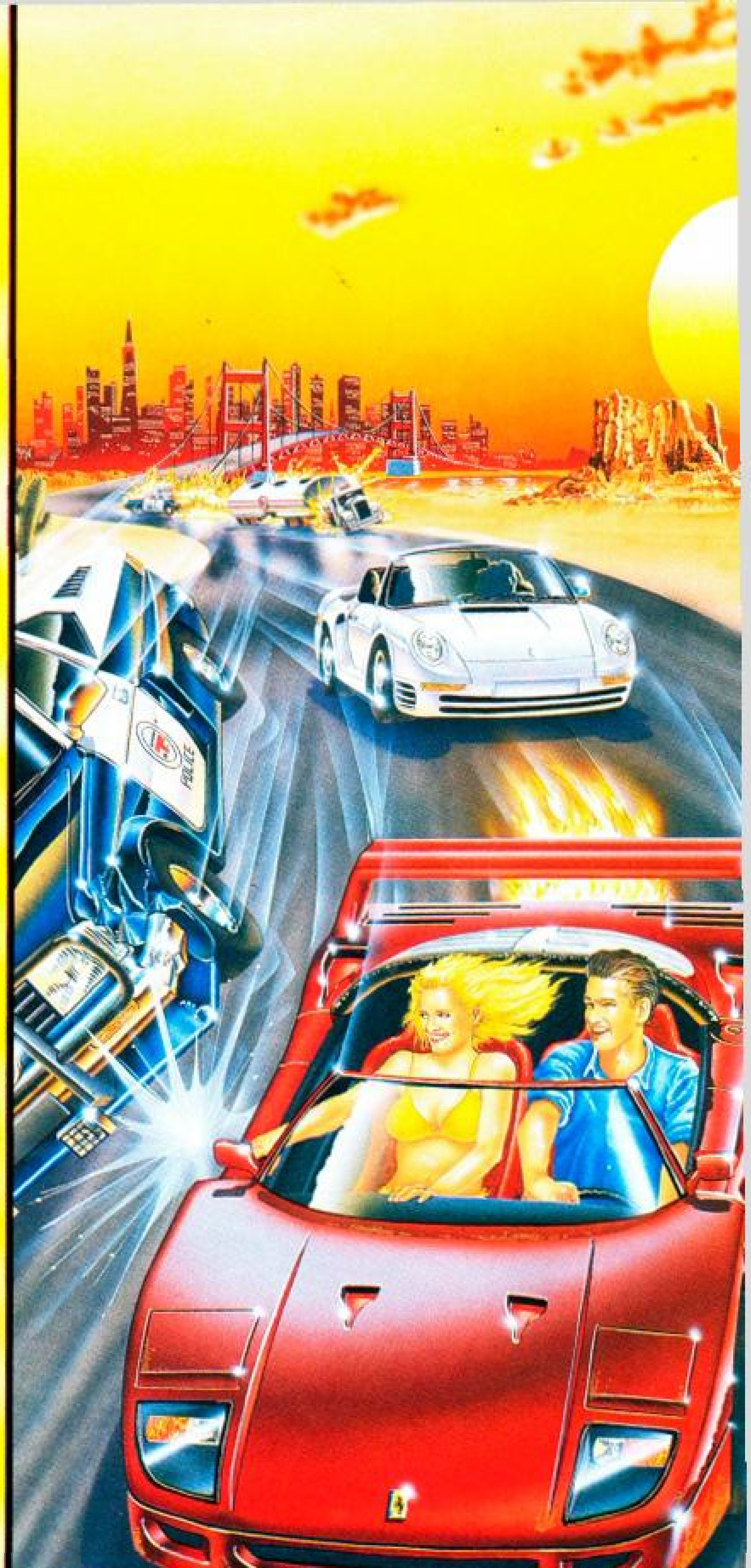






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